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UK METEOROLOGICAL OFFICE
GLOBAL DATA MONITORING REPORT

December 2002

Data Assimilation
Meteorological Office
London Rd
Bracknell
Berkshire
RG12 2SZ

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1. Introduction

As the WMO-appointed lead centre for monitoring surface marine data, the U.K. Meteorological Office produces monthly statistics on the quality of these observations received at RSMC Bracknell. This report includes this information along with statistics for most other types of data. The figures and tables contained herein are presented according to the agreed standards for the exchange of monitoring results.

The report is based on data received at the UK Meteorological Office Headquarters, Bracknell in time for inclusion into the appropriate analysis (the current cut-off time is approximately 7.2 hours after each analysis time). The evaluation of data quality is based on comparison with the appropriate 6-hour global model forecast (background) field, although to provide background values valid at the observation time for non-main hour data, time-interpolation of the T+3, T+6 and T+9 forecasts is used; and for sea surface temperature the background field is the analysis from the previous day. Generally, the background field is of high quality except in data sparse areas, tropical regions and areas close to steep orography where care should be taken in interpreting the statistics shown.

Comments or queries on the report are welcome and should be addressed to:-

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2 Global Data Monitoring Statistics

Ships, Fixed buoys, Platforms and Drifting buoys observations

TABLES 1and 2 contain lists of the stations which are considered to have returned suspect observations of pressure, windspeed, wind direction or sea surface temperature, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 1 and 2 show 10 degree lat/long box average numbers of SHIP/SYNOP and DRIFTER observations received per day throughout the month at Bracknell and assimilated into model runs. All data are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Synop Observations

Table 3 contains a list of stations which are considered to have returned suspect observations of Pressure during the month. The criteria for quality control are given in the header page. The reporting practice of each station is included in the list of statistics.

At the UK Met. Office, we monitor SYNOP pressure after it has been interpolated to our Global NWP Model's surface height. For most synoptic stations (about 75%), the surface pressure (at the model surface) is calculated from the reported station-level pressure, or, if this is not available, the height of a standard pressure-level (e.g. 850 hPa or 700 hPa). If neither of these are available, or if the reported station-level pressure is deemed unreliable, the reported mean sea-level pressure is used (about 25% of SYNOPs).

Aircraft observations

Tables 4A (300-150 hPa) and 4B (1000-301 hPa) contain lists of statistics calculated from data received from all airline carriers.

Figures 3A (300-150 hPa) and 3B (1000-301 hPa) show 10 degree lat/long box average numbers of aircraft reports in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS) received per day throughout the month at Bracknell and assimilated into model runs. Observations with a vector wind difference (compared with the model background field) of >60 m s^{-1} have been excluded. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

Figures 4A-7A (300-150 hPa) and 4B-7B (1000-301 hPa) show wind statistics for AIREP/ASDAR in AIREP/AMDAR code (including AIREP, ACAR, AMDAR, ASDAR and ADS). Observations with a vector wind difference > 60 m s^{-1} have been excluded. Statistics have not been calculated for 10 degree lat/long boxes containing <31 observations.

Figure	Parameter
4	Mean wind vectors
5	Mean observation - background wind vector
6	Mean observation-background speed (m s^{-1})
7	RMS observation-background vector (m s^{-1})

Radiosonde Observations

TABLES 5-7 contain lists of the stations which are considered to have returned suspect observations of geopotential height, vector wind or wind direction, as appropriate, during the month. The criteria for quality control are given on the header page for each table.

Figures 8 and 9 show 10 degree lat/long box average numbers of TEMP 500 hPa GEOPOTENTIAL HEIGHT and TEMP/PILOT 300 hPa WIND observations received per day throughout the month at Bracknell and assimilated into model runs. Data from all hours are included. Box average values are plotted as the nearest whole number (values of x.5 are rounded up). Where the average is more than 999, then 999 is plotted. A box with no observations is blank. If the 24 hour average >0 but <0.5, then 0 is plotted.

APPENDIX I shows details of the gross error limits used in TABLES 5 and 6 and the weights used in the RMS values in TABLE 5.

Satellite Observations

Figures 10-24 show satellite wind statistics for all geostationary satellites. All plots other than **AVAILABILITY** show average data where there are > 10 observations in a 10 degree lat/long box.

Figure	Parameter Plotted	Layer (hPa)
10	Availability/average daily number	701-1000
11	Vector mean wind (observed)	701-1000
12	Observation-background vector wind difference	701-1000
13	Mean observation-background speed differences	701-1000
14	RMS observation-background vector difference	701-1000
15	Availability/average daily number	401-700
16	Vector mean wind (observed)	401-700
17	Observation-background vector wind difference	401-700
18	Mean observation-background speed differences	401-700
19	RMS observation-background vector difference	401-700
20	Availability/average daily number	101-400
21	Vector mean wind (observed)	101-400
22	Observation-background vector wind difference	101-400
23	Mean observation-background speed differences	101-400
24	RMS observation-background vector difference	101-400

Figures 25-39 show sounding statistics from the polar orbitting satellite NOAA-15. Figure 25 shows the mean daily number of ATOVS soundings, and figures 26-39 show mean and standard deviation observation-background differences for brightness temperature for selected channels.

Figure		Weighting function peak (hPa)
26	Mean	Surface (HIRS8)
27	SD	Surface (HIRS8)
28	Mean	700 (HIRS15)
29	SD	700 (HIRS15)
30	Mean	500-700 (HIRS11)
31	SD	500-700 (HIRS11)
32	Mean	400 (HIRS4)
33	SD	400 (HIRS4)
34	Mean	700 (AMSUA5)
35	SD	700 (AMSUA5)
36	Mean	300 (AMSUA7)
37	SD	300 (AMSUA7)
38	Mean	100 (AMSUA9)
39	RMS	100 (AMSUA9)

Figures 40-54 show sounding statistics from the polar orbitting satellite NOAA-16. Figure 40 shows the mean daily number of ATOVS soundings, and figures 41-54 show mean and standard deviation observation-background differences for brightness temperature for selected channels.

Figure		Weighting function peak (hPa)
41	Mean	Surface (HIRS8)
42	SD	Surface (HIRS8)
43	Mean	700 (HIRS15)
44	SD	700 (HIRS15)
45	Mean	500-700 (HIRS11)
46	SD	500-700 (HIRS11)
47	Mean	400 (HIRS4)
48	SD	400 (HIRS4)
49	Mean	700 (AMSUA5)
50	SD	700 (AMSUA5)
51	Mean	300 (AMSUA7)
52	SD	300 (AMSUA7)
53	Mean	100 (AMSUA9)
54	RMS	100 (AMSUA9)

Figures 55-69 show sounding statistics from the polar orbitting satellite NOAA-17. Figure 55 shows the mean daily number of ATOVS soundings, and figures 56-69 show mean and standard deviation observation-background differences for brightness temperature for selected channels.

Figure		Weighting function peak (hPa)
56	Mean	Surface (HIRS8)
57	SD	Surface (HIRS8)
58	Mean	700 (HIRS15)
59	SD	700 (HIRS15)
60	Mean	500-700 (HIRS11)
61	SD	500-700 (HIRS11)
62	Mean	400 (HIRS4)
63	SD	400 (HIRS4)
64	Mean	700 (AMSUA5)
65	SD	700 (AMSUA5)
66	Mean	300 (AMSUA7)
67	SD	300 (AMSUA7)
68	Mean	100 (AMSUA9)
69	RMS	100 (AMSUA9)

N.B. All satellite sounding data is bias-corrected (and thinned) before being assimilated in the UKMO NWP model.

3 Composite Observing Systems for the North Atlantic (COSNA)

This section shows statistics for upper air (radiosonde and aircraft) and surface (drifter) data for the North Atlantic area for data received at Bracknell during the month.

TABLE 8 shows quality statistics for **Mean Sea-level Pressure, Windspeed and Wind Direction** received at Bracknell in DRIFTER code during the month for the area 10°N - 80°N, 85°W - 0°W.

TABLE 9 shows quality statistics for **Temperature and Vector Wind** received at Bracknell from aircraft during the month for the area 40°N - 70°N, 60°W - 0°W.

Table 10 - 13 show quality statistics **(Geopotential Height and Windspeed at 100 and 500 hPa)** for all TEMPSHIPS in the area bounded by 0°N - 90°N, 100°W - 40°E and selected TEMP stations within the same area.

Revisions

1. May 95 Monitoring statistics for NOAA-11 removed. Figures 25-27 now show data for NOAA-12
2. May 95 Notes giving details of observations included in wind direction statistics clarified and corrected.
3. August 95 Monitoring statistics for NOAA-14 added with figures 28-30.
4. February 96 Monitoring statistics for GOES-7 have been replaced by statistics for GOES-8 and GOES-9.
5. April 96. 500 km and 120 km SATEMs replaced by 120 km resolution temperature profiles produced locally from the radiances disseminated by NESDIS.
6. February 97 Monitoring statistics for Meteosat 5 have been replaced by statistics for Meteosat 6.
7. Sept 97 Monitoring statistics for NOAA-12 removed. Figures 25-27 now show data for NOAA-11
8. January 1998. Increase in resolution of UKMO global forecast model.
9. April 1998. GOES winds ceased on 2nd March 1998, and were replaced with GOES high resolution winds from 15th.
10. June 1998. Monitoring statistics for Meteosat-6 were replaced by monitoring statistics for Meteosat-7, from 3rd June.
11. June 1998. Corrections in our processing of radiosonde data resulted in a decrease in the number of 500hPa geopotential heights in Figure 8 of about 230 per 24 hours (compared with previous reports), and a small increase in the number of 300hPa winds in Figure 9.
12. July 1998. Meteosat-5 began transmitting winds from 2nd July, at 63 degrees East (over the Indian ocean), and this data is included in the statistics.
13. July 1998. GOES-9 (at 135W) was replaced mid-month by GOES-10 (initially at 105W, moving towards 135W).
14. February 1999. Problems with NOAA-11, and TOVS data ceased to be assimilated from 26 February.
15. March 1999. UKMO introduced 3-D VAR assimilation system on 29 March, and also began assimilating ATOVS data from NOAA-15.
16. May 1999. Included statistics for ATOVS sounding data from NOAA-15.
17. September 1999. Included statistics for high resolution visible winds from Meteosat-5 and Meteosat-7.
18. October 1999. The 3-D VAR assimilation system was upgraded on 19 October, including improvements in the assimilation of ATOVS radiances, use of SSM/I surface wind speed, an improvement in the calculation of surface pressure for SYNOPs, and thinning and revision of observation errors of aircraft data.
19. November 1999. High resolution visible winds from Meteosat-5 and Meteosat-7 removed until used operationally.
20. April 2000. Aireps in Table 4 and Figures 3-7 split into ranges 300-150 hPa (A) and 1000-301 hPa (B).
21. September 2000. Corrected an error affecting the mean positions of a minority of buoys in Table 2.
22. November 2000. An error in the production of Table 6 was corrected. Previously, some sondes with suspect vector winds were being missed.
23. April 2001. Included statistics for ATOVS sounding data from NOAA-16.
24. May 2001. Included statistics for sea surface temperatures from marine surface observations.
25. December 2002. Included statistics for ATOVS sounding data from NOAA-17.
26. December 2002. Meteosat-7 and Meteosat-5 SATOB winds replaced by higher resolution BUFR-coded winds.

TABLE 1

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SHIPS, FIXED BUOYS AND PLATFORMS
MONITORING CENTRE: BRACKNELL
MONTH: December 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for ships, fixed buoys and platforms.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (Degrees).
:Sea surface temperature (Degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:PGE :Percentage of observations with gross errors.

:%REJ :Percentage of observations flagged excluding those with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)
:10 degrees (sea surface temperature)

SELECTION CRITERIA :NOBS ≥ 20 , and one or more of the following:

1.|bias|	≥ 4 hPa	(pressure),
	≥ 5 m s^{-1}	(wind speed),
	≥ 30 degrees	(direction),
	≥ 3 degrees	(sea surface temperature).
2.SD	≥ 6 hPa	(pressure),
	≥ 80 degrees	(direction),
	≥ 5 degrees	(sea surface temperature).
3.PGE	≥ 25	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE							
C6LU3	P	50	2	28	1.5	5.8	6.0
DXLU	P	20	0	25	3.2	-4.1	5.2
ELXZ7	P	20	0	35	0.9	-4.0	4.1
HODM	P	22	0	36	3.0	4.8	5.7
KS006	P	100	0	38	2.1	5.0	5.5
LAVV4	P	34	0	53	1.5	4.4	4.7
MVLA7	P	24	0	0	1.9	4.2	4.6
PJKS	P	26	0	85	4.4	-8.6	9.6
SGIX	P	41	0	0	1.4	-4.2	4.5
UCJB	P	22	0	5	1.8	-4.1	4.5
UCTS	P	59	0	63	2.1	-4.3	4.8
UIFU	P	21	38	43	3.3	-1.8	3.8
VGFQ	P	20	35	55	4.2	-4.7	6.3
VJT6198	P	64	2	66	2.1	-6.8	7.1
VTXG	P	51	0	65	1.6	4.7	4.9
VVKT	P	33	0	64	1.3	-4.1	4.2
WCY7054	P	44	0	80	2.2	5.7	6.1
WYL4978	P	21	0	48	4.4	5.6	7.1
XPYM	P	41	0	0	0.7	4.0	4.1
ZDDY7	P	25	0	44	2.2	-4.2	4.8
3FOC5	P	28	0	46	3.8	5.6	6.8
31057	P	1250	5	66	4.4	4.5	6.2
42043	P	263	0	96	0.6	4.0	4.0
48092	P	236	74	96	7.9	-3.1	8.5
62301	P	711	31	97	7.5	0.0	7.5
WIND SPEED							
A8AD7	SPEED	24	0	0	3.2	-5.0	6.0
A8AM7	SPEED	39	0	33	3.6	8.6	9.3
A8AX8	SPEED	24	4	33	8.1	5.4	9.8
BBXX KS0	SPEED	347	0	100	2.1	-6.1	6.4
C6T2063	SPEED	21	0	0	2.0	5.5	5.9
DANM	SPEED	21	10	100	4.3	6.1	7.5
KS000	SPEED	167	0	100	2.1	-6.0	6.4
KS002	SPEED	52	0	0	1.0	-6.3	6.4
KS004	SPEED	170	0	100	1.6	-6.0	6.2
KS005	SPEED	72	0	100	2.9	-5.1	5.8
KS006	SPEED	93	0	100	1.9	-6.1	6.4
KS025	SPEED	163	0	100	2.5	-6.2	6.6
OYVQ2	SPEED	20	0	70	6.6	7.9	10.3
OZQS2	SPEED	42	2	100	4.8	11.4	12.4
V2AZ5	SPEED	23	0	22	3.8	5.8	6.9
V2FN	SPEED	23	9	100	4.8	13.3	14.1
ZDDY7	SPEED	24	0	25	4.5	6.6	8.0
3ETX6	SPEED	91	5	73	4.9	5.4	7.3
3FZM	SPEED	51	0	100	4.5	-7.3	8.5
44145	SPEED	237	1	5	3.7	5.4	6.5
9MET	SPEED	35	0	29	7.7	7.2	10.6
WIND DIRECTION							
DANR	DIRN.	21	0	0	38.6	72.6	82.2
VCLM	DIRN.	45	0	0	145.3	-14.6	146.0
V7AP3	DIRN.	26	0	0	65.3	-31.1	72.3
ZDLP	DIRN.	26	8	0	81.8	22.6	84.9
3FDV6	DIRN.	25	8	0	93.9	16.7	95.4
62414	DIRN.	60	0	0	33.6	-31.4	45.9

IDENTIFIER	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
SEA SURFACE TEMPERATURE							
A8AV8	SST	28	0	46	2.3	-3.1	3.9
CGDS	SST	283	67	94	1.3	-0.7	1.4
CGDX	SST	149	100	100			
CG2960	SST	196	34	39	2.1	-0.7	2.3
C6MS4	SST	29	0	100	0.9	-3.5	3.6
DBBC	SST	672	49	49	0.9	-0.9	1.2
DBBI	SST	349	49	49	0.7	-1.2	1.4
DBBX	SST	673	60	100	1.4	0.2	1.4
DHMN	SST	31	0	100	0.7	3.0	3.0
EIQN	SST	704	86	100	1.1	-0.4	1.1
ELKU8	SST	47	0	79	1.4	3.0	3.3
ELTS6	SST	55	4	89	2.4	6.9	7.3
ELXZ7	SST	21	0	10	0.6	3.1	3.1
ELYE8	SST	45	4	100	0.6	3.6	3.6
ELZL3	SST	453	41	100	1.3	1.2	1.8
FNJI	SST	114	0	100	0.7	3.1	3.2
HPEW	SST	21	0	38	3.6	3.1	4.8
H3QA	SST	73	0	100	1.2	-3.7	3.9
KRPB	SST	67	1	100	1.0	-3.5	3.7
LACF5	SST	37	0	100	1.8	3.3	3.8
LARS5	SST	33	12	100	3.8	-6.7	7.7
MVXQ8	SST	29	0	69	1.0	-3.5	3.6
MZDL7	SST	85	26	26	0.5	1.3	1.4
OZWP2	SST	43	0	100	0.8	3.1	3.2
PCIG	SST	20	0	10	0.8	-3.0	3.1
PDYX	SST	27	0	100	0.6	-3.8	3.8
P3FN9	SST	29	17	62	2.4	3.8	4.5
SHIPAO	SST	44	9	45	2.9	-3.1	4.3
UAIR	SST	22	0	50	1.8	-3.2	3.6
UCJL	SST	55	2	100	0.9	3.7	3.8
UCJO	SST	24	8	92	1.3	-4.6	4.8
UCOL	SST	69	0	81	1.4	-4.1	4.3
VCLM	SST	202	50	100	1.4	1.3	1.9
VGLZ	SST	34	100	100			
VOCJ	SST	232	0	100	1.6	3.3	3.7
V2AQ3	SST	24	4	63	2.6	-5.0	5.6
V7AV6	SST	27	30	100	2.4	-2.6	3.6
V7DP7	SST	31	3	77	1.1	-4.3	4.5
XYYY	SST	36	0	100	1.7	5.0	5.2
YJQL3	SST	51	2	61	1.2	-4.2	4.4
ZCBO5	SST	27	7	48	2.6	-4.6	5.2
ZMFR	SST	99	84	100	0.5	-9.3	9.3
3FMM6	SST	28	0	100	0.9	-4.3	4.4
3FRR5	SST	55	0	100	1.7	3.6	3.9
41008	SST	711	0	93	0.7	-4.2	4.3
42007	SST	690	0	58	0.6	-3.1	3.1
42021	SST	647	0	98	0.5	-4.1	4.1
44137	SST	711	0	77	2.3	4.7	5.2
46131	SST	714	100	100			
46146	SST	707	100	100			
46181	SST	714	100	100			
9VVN	SST	33	0	76	2.7	-6.2	6.7

Figure 1. SHIP/SYNOP mean daily count. DECEMBER 2002
All hours
Global average number of observations in 24 hours = 20137

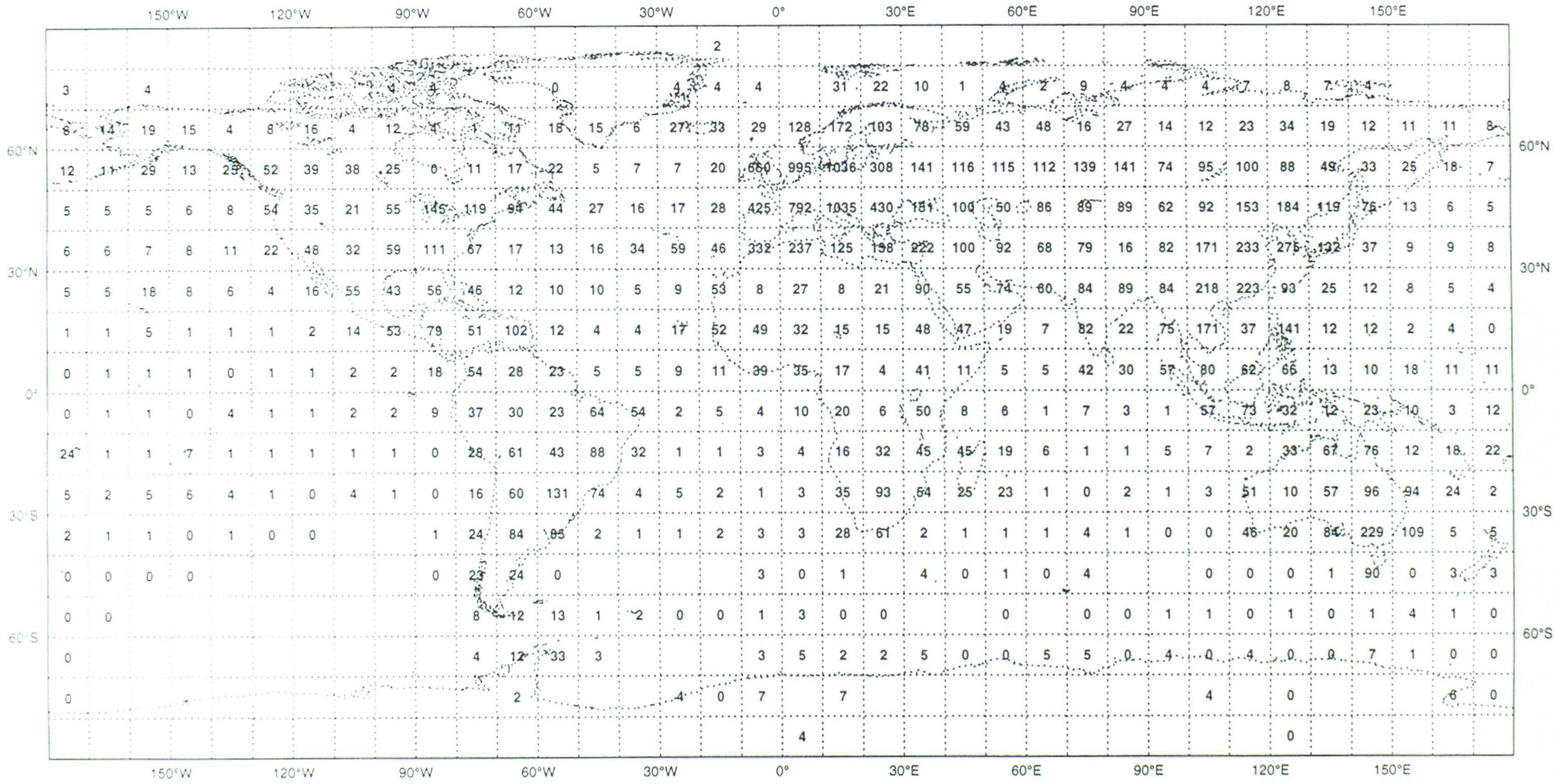

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 2

MONITORING OF MARINE SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - DRIFTING BUOYS
MONITORING CENTRE: BRACKNELL
MONTH: December 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoys.

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times : All hours

Elements monitored
:Mean sea level pressure (hPa).
:Wind speed (m s^{-1}).
:Wind direction (degrees).
:Sea surface temperature (degrees).

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:PGE :Percentage of observations with gross errors.

:%REJ : Percentage of observations flagged excluding those with gross errors

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. a positive bias indicates the wind observation is veered to the background.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors.

GROSS ERROR LIMIT
:15 hPa (pressure)
:25 m s^{-1} (vector wind)
:10 degrees (sea surface temperature)

SELECTION CRITERIA :	NOBS	≥ 20 , and one or more of the following:	
	1.|bias|	≥ 4 hPa	(pressure),
		≥ 5 m s^{-1}	(wind speed),
		≥ 30 degrees	(direction),
		≥ 3 degrees	(sea surface temperature).
	2.SD	≥ 6 hPa	(pressure),
		≥ 80 degrees	(direction),
		≥ 5 degrees	(sea surface temperature).
	3.PGE	≥ 25.	

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 m s^{-1}

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
16951	-43.9	52.0	P	143	3	100	3.4	7.0	7.8
25571	86.5	-175.5	P	228	30	100	4.9	0.2	4.9
41536	20.3	-71.9	P	92	89	100	1.3	13.7	13.8
44504	50.7	-39.3	P	184	70	100	6.5	-3.2	7.2
44511	40.9	-29.6	P	154	36	95	3.3	-10.5	11.0
44776	46.8	-38.6	P	28	18	89	7.0	5.9	9.2
48574	75.2	-133.6	P	555	50	100	8.5	2.1	8.7
61532	41.1	30.0	P	208	59	100	0.7	13.8	13.8
64606	63.7	-39.6	P	56	45	68	3.7	3.9	5.4
WIND SPEED									
52537	31.6	136.4	SPEED	715	0	100	3.3	-7.0	7.7
WIND DIRECTION									
21535	27.2	148.0	DIRN.	408	0	0	28.3	-32.4	43.0
23924	12.6	86.4	DIRN.	237	0	0	14.7	82.6	83.8
41536	20.3	-71.9	DIRN.	36	3	0	28.4	63.5	69.6
41648	26.8	-73.1	DIRN.	483	1	0	25.5	36.0	44.2
46701	41.8	-173.9	DIRN.	78	0	0	39.2	-45.3	59.9
52643	33.2	141.2	DIRN.	483	15	0	25.0	-38.4	45.9
SEA SURFACE TEMPERATURE									
17510	-41.4	59.7	SST	648	0	96	0.5	-3.7	3.7
21534	41.4	139.8	SST	110	90	100	0.3	8.4	8.4
21640	36.1	166.4	SST	39	5	100	1.9	-5.8	6.1
23510	5.8	73.0	SST	289	100	100			
31975	-22.9	-43.1	SST	29	0	100	1.8	3.8	4.2
32526	2.1	-85.9	SST	183	100	100			
32907	8.4	-79.2	SST	174	100	100			
33502	-29.0	-12.9	SST	110	0	100	0.5	3.9	4.0
41577	34.7	-76.5	SST	732	12	100	2.5	-7.4	7.8
44504	50.7	-39.3	SST	188	0	100	0.7	6.7	6.8
44776	46.8	-38.4	SST	25	92	92	0.0	-1.3	1.3
46577	48.0	-124.2	SST	336	40	44	0.4	0.1	0.4
46972	16.2	-138.2	SST	239	0	100	0.4	4.1	4.1
51645	-19.7	-168.0	SST	298	0	100	1.2	3.3	3.5
51909	-3.7	-153.3	SST	268	100	100			
52533	32.6	172.9	SST	128	35	100	0.3	9.6	9.6
55905	-54.4	-98.8	SST	498	0	100	0.3	3.0	3.0
61532	41.1	30.0	SST	210	14	90	3.9	-4.6	6.0
61669	-45.4	-53.0	SST	189	0	93	0.5	3.2	3.3
62711	62.9	-37.8	SST	1183	0	44	3.0	3.0	4.3
64553	63.7	-25.2	SST	543	0	87	1.2	4.4	4.6
64606	62.2	-41.3	SST	674	0	98	1.8	4.5	4.8

Figure 2. DRIFTER mean daily count. DECEMBER 2002
All hours
Global average number of observations in 24 hours = 9188

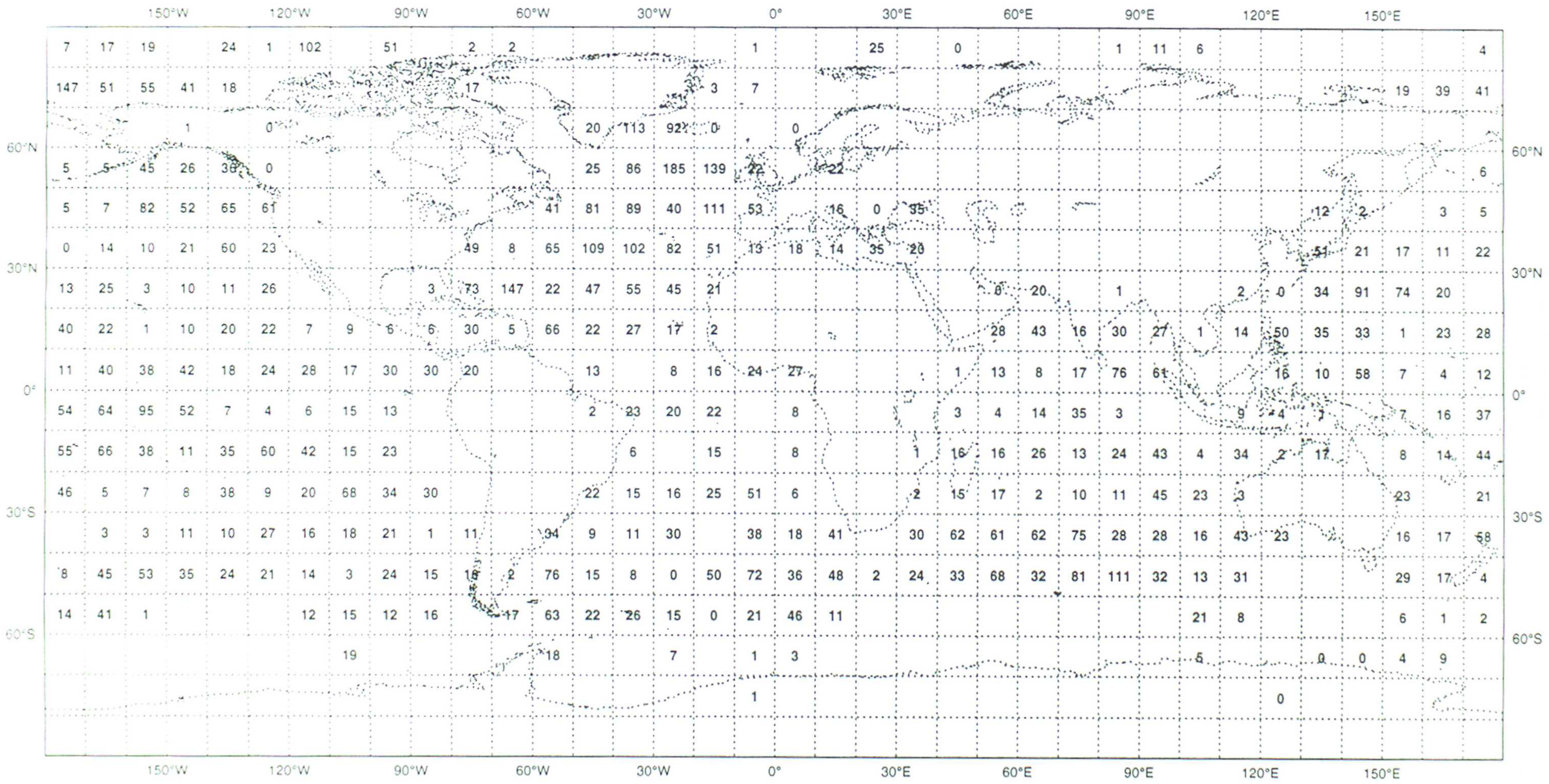

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

TABLE 3

MONITORING OF LAND SURFACE OBSERVATIONS
MONTHLY SUSPECT LIST - SYNOPS & AUTOSYNOPS
MONITORING CENTRE: BRACKNELL
MONTH: December 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for synops & autosynops.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00, 06, 12, 18 UTC
Elements monitored		:Surface pressure (hPa).
Parameters monitored	:HT(m)	:Station height (in metres) as given in WMO No. 9 Vol A
	:RP	:Pressure reporting practice M=mean sea level pressure (hPa) reported. S=Station level pressure reported. 8=Geopotential height (m) of 850 hPa surface reported. 7=Geopotential height (m) of 700 hPa surface reported.
	:NOBS	:Number of observations received excluding duplicates.
	:NGE	:Number of observations with gross errors.
	:PGE	:Percentage of observations with gross errors.
	:%REJ	:Percentage of observations flagged excluding those with gross errors.
	:SD	:SD of difference of observations from background values excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors.
GROSS ERROR LIMIT	:15 hPa	(pressure)
SELECTION CRITERIA	:NOBS	$\geq$ 20 ,and one or more of the following:
	1.|bias|	$\geq$ 4 hPa
	2. SD	$\geq$ 6 hPa
	3.PGE	$\geq$ 25.

N.B. For stn ht $\geq$ 500m, mslp is that calculated from station level pressure where available.
For stn ht < 500m, mslp is that as reported by the station where available.

WMO REGION 1:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
60728	36.4N	10.7E	1	MS	61	0	0	0	0.6	-8.7	8.7
61967	7.3S	72.4E	1	M	28	0	0	100	0.6	9.4	9.4
62790	12.1N	24.9E	674	MS	57	1	2	2	1.6	4.2	4.5
63160	10.4N	45.0E	9	M	29	0	0	28	1.1	-4.0	4.1
63680	0.3N	32.6E	1144	M	20	0	0	5	2.2	-4.5	5.0
63801	4.9S	29.6E	882	S8	103	0	0	1	2.3	7.8	8.1
65355	9.8N	1.1E	342	MS	68	0	0	1	2.6	-12.7	13.0
67308	22.1S	31.7E	452	M	27	27	100	0			
68030	18.5S	25.6E	1071	8	59	0	0	3	1.2	4.6	4.8
68038	20.5S	26.0E	903	M	41	2	5	2	1.8	4.0	4.4
68312	26.5S	18.1E	1067	S8	62	0	0	0	1.0	6.7	6.8
68338	26.9S	24.6E	1234	S8	38	38	100	0			
68396	26.5S	31.3E	641	S8	56	0	0	0	1.1	4.8	4.9
68575	30.0S	30.0E	1175	S8	114	114	100	0			

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
24382	66.4N	143.2E	196	MS	62	0	0	35	3.3	4.7	5.7
24671	63.9N	135.9E	402	MS	120	4	3	18	4.7	7.2	8.6
24688	63.3N	143.2E	741	MS	114	32	28	0	4.9	5.4	7.3
30554	54.5N	113.6E	995	MS	121	3	2	0	2.8	7.9	8.4
30622	54.0N	105.9E	533	MS	121	0	0	15	3.9	4.2	5.7
30669	53.1N	117.5E	708	MS	24	0	0	0	1.3	-4.7	4.9
30811	51.7N	102.5E	721	MS	116	3	3	0	4.7	4.0	6.2
30967	49.9N	115.8E	623	MS	89	0	0	0	2.6	-7.7	8.1
31123	57.8N	130.9E	255	MS	120	1	1	0	2.9	4.3	5.2
31137	56.3N	131.1E	850	MS	120	10	8	0	5.1	4.1	6.5
31474	51.6N	133.3E	384	MS	119	0	0	34	3.2	4.2	5.3
31655	49.4N	136.6E	33	MS	31	0	0	10	1.1	-4.1	4.2
35358	49.6N	63.5E	123	MS	109	0	0	35	3.9	-4.7	6.1
36020	52.5N	80.2E	59	MS	60	11	18	48	6.7	-5.5	8.7
36096	51.7N	94.5E	628	M	119	25	21	0	5.1	6.9	8.6
36982	41.9N	78.2E	3635	S7	120	5	4	1	1.4	4.9	5.1
38343	42.9N	72.8E	683	M	120	0	0	22	2.1	4.4	4.9
40700	39.6N	47.9E	45	MS	43	0	0	0	1.5	-5.6	5.8
40713	37.4N	46.3E	1475	MS	45	18	40	4	3.3	12.6	13.0
40726	36.8N	45.7E	1384	MS	38	1	3	0	1.0	4.0	4.1
40741	36.5N	61.2E	235	MS	45	1	2	0	1.3	-5.0	5.2
40757	35.6N	53.4E	1171	MS	45	0	0	0	1.2	5.5	5.6
40780	33.6N	46.4E	1362	MS	46	0	0	48	0.9	4.4	4.5
41254	23.1N	57.6E	1755	S8	75	75	100	0			
41314	17.7N	54.0E	467	MS	114	0	0	0	0.8	4.0	4.1
41396	16.0N	48.9E	700	MS	72	1	1	0	1.0	6.4	6.5
43415	8.8N	80.5E	98	S	60	59	98	0	0.0	12.4	12.4
44265	46.1N	91.5E	1186	MS	117	0	0	6	2.9	4.8	5.6
44304	47.3N	110.6E	1035	MS	117	1	1	3	2.4	-6.5	6.9
44416	28.6N	81.6E	720	MS	68	3	4	4	1.4	4.3	4.5
47022	40.8N	128.2E	1224	S	81	0	0	4	1.7	4.1	4.4
48924	21.1N	101.5E	644	M	20	1	5	0	1.0	10.6	10.6
48925	20.7N	102.0E	550	M	25	13	52	0	1.1	-12.6	12.6
48935	19.5N	103.1E	1050	8	31	1	3	3	0.7	-8.6	8.6
51288	45.4N	90.5E	1651	S	121	0	0	30	2.2	-5.7	6.1
51334	44.6N	82.9E	321	M	119	2	2	47	4.0	5.0	6.4
51379	44.0N	89.6E	794	M	120	0	0	50	2.9	6.5	7.1
51495	43.2N	91.7E	874	M	119	20	17	19	2.5	10.3	10.6
51818	37.6N	78.3E	1376	M	118	0	0	49	2.6	6.8	7.3
52378	41.4N	102.4E	960	M	119	0	0	46	2.7	5.8	6.4

WMO REGION 2:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
52866	36.6N	101.8E	2262	S	121	0	0	0	1.3	-4.4	4.6
53083	44.6N	114.2E	1183	M	120	1	1	28	3.1	7.5	8.1
53352	41.7N	110.4E	1377	M	119	7	6	71	3.4	7.2	8.0
53480	41.0N	113.1E	1416	M	120	0	0	51	2.9	6.1	6.8
53487	40.1N	113.3E	1069	M	119	0	0	26	2.7	5.0	5.7
53502	39.8N	105.8E	1143	M	119	0	0	66	3.0	6.1	6.8
53593	39.8N	114.6E	910	M	119	0	0	27	3.7	4.8	6.1
53673	38.8N	112.7E	838	M	120	0	0	14	2.3	4.4	5.0
53705	37.5N	105.7E	1185	M	118	0	0	36	2.2	5.3	5.7
53764	37.5N	111.1E	951	M	120	0	0	11	2.4	4.4	5.0
54115	43.6N	118.1E	800	M	119	0	0	24	1.8	4.7	5.0
54311	41.9N	117.8E	844	M	119	0	0	11	2.2	4.8	5.3
54386	41.4N	128.2E	1018	M	119	0	0	79	2.6	6.8	7.3
54826	36.3N	117.1E	1536	S	119	0	0	40	1.7	-4.0	4.3
56193	32.4N	104.5E	877	M	120	0	0	60	1.9	5.4	5.7
56287	30.0N	103.0E	629	M	120	0	0	13	1.7	4.9	5.2
56385	29.5N	103.3E	3049	S	120	0	0	82	1.8	-5.9	6.2
56462	29.0N	101.5E	2994	S	121	0	0	0	1.6	8.6	8.7
57006	34.6N	105.8E	1143	M	120	0	0	4	1.9	4.9	5.3
57016	34.3N	107.1E	610	M	120	0	0	16	1.6	4.7	5.0
57816	26.6N	106.7E	1074	MS	121	121	100	0			

WMO REGION 3:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
80099	7.1N	70.7W	128	MS	31	0	0	0	1.9	-8.1	8.3
82181	2.0S	54.1W	146	MS	82	0	0	0	0.9	5.8	5.9
82704	7.6S	72.7W	170	MS	82	0	0	0	1.0	-4.5	4.6
82765	7.3S	47.5W	193	MS	82	0	0	0	1.0	4.2	4.3
83235	12.4S	46.4W	604	MS	86	0	0	1	0.9	7.2	7.3
83319	14.7S	52.4W	315	MS	80	0	0	1	1.3	4.3	4.5
83332	14.1S	46.4W	826	MS	86	49	57	0	0.4	14.5	14.5
83470	17.9S	50.9W	727	MS	86	0	0	27	1.1	-4.5	4.6
83531	18.6S	46.5W	940	MS	84	0	0	0	0.7	-5.9	5.9
83630	20.6S	47.4W	1026	MS	85	0	0	0	0.8	4.0	4.1
83836	25.5S	50.6W	837	MS	86	0	0	0	0.6	-5.1	5.1
84425	5.9S	76.1W	179	MS	84	0	0	0	1.7	5.7	5.9
84455	6.5S	76.4W	281	MS	85	0	0	2	1.7	6.5	6.7
84472	7.1S	78.5W	2620	S	58	0	0	0	0.7	-5.5	5.5
84474	7.2S	76.7W	350	S	23	0	0	0	1.1	8.9	9.0
84686	13.6S	72.0W	3248	S	111	0	0	0	0.9	-4.7	4.8
84688	13.7S	73.4W	3444	S	51	0	0	0	0.4	-12.5	12.5
84720	14.9S	75.0W	567	MS	56	0	0	0	0.8	4.5	4.6
84782	18.1S	70.3W	468	MS	90	0	0	0	1.2	7.6	7.7
85264	18.5S	64.1W	1998	S	56	56	100	0			
85312	19.8S	63.9W	992	S	42	1	2	2	1.3	-10.3	10.4
85406	18.3S	70.3W	55	M	117	0	0	0	0.9	4.1	4.2
85432	22.5S	68.9W	2320	S8	79	0	0	0	0.6	5.5	5.5
87904	60.3S	72.1W	199	MS	111	72	65	0	4.4	10.1	11.0

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71048	61.6N	125.8W	610	MS	95	0	0	1	1.8	7.5	7.7
71049	66.0N	91.8W	150	MS	119	102	86	8	0.8	13.8	13.8
71181	47.1N	55.3W	29	MS	121	0	0	0	0.9	-6.3	6.4
71475	49.3N	124.8W	2	MS	86	0	0	0	1.2	-7.7	7.8
71506	67.0N	136.2W	720	MS	118	0	0	2	1.6	-5.0	5.2

WMO REGION 4:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
71599	44.4N	65.2W	127	MS	117	0	0	17	0.8	-4.7	4.8
71747	48.8N	91.6W	424	MS	121	0	0	8	0.7	4.1	4.2
72327	36.1N	86.7W	182	MS	120	0	0	0	0.6	4.1	4.1
72375	34.6N	111.2W	2291	MS	118	41	35	65	1.5	2.8	3.2
76118	30.4N	109.7W	1041	MS	25	0	0	0	0.5	-10.8	10.8
76243	28.7N	100.5W	250	MS	99	1	1	6	1.4	4.9	5.1
76491	23.8N	99.1W	355	MS	81	0	0	4	1.7	4.1	4.4
76543	22.0N	98.8W	104	MS	30	0	0	3	1.4	7.2	7.3
76683	19.3N	98.3W	2248	MS	85	0	0	0	0.7	4.2	4.3
76743	18.0N	92.9W	16	MS	71	0	0	0	0.8	6.0	6.1
76762	17.5N	99.5W	1265	MS	75	0	0	0	1.0	5.6	5.7
76773	17.8N	97.8W	1650	MS	37	0	0	0	1.2	4.4	4.6
76903	14.9N	92.3W	118	MS	113	0	0	0	0.7	5.7	5.7
78655	14.0N	89.6W	725	M	29	1	3	97	0.9	7.5	7.6

WMO REGION 5:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
92010	6.1S	145.4E	1587	M	38	0	0	0	0.8	8.9	8.9
94130	14.8S	131.9E	120	MS	120	0	0	0	1.5	5.3	5.5
94541	29.8S	151.1E	584	M	49	0	0	100	0.9	-8.4	8.4
95541	29.8S	151.1E	582	MS	50	0	0	0	1.0	-5.1	5.2
96505	3.7N	115.7E	902	S8	48	38	79	0	1.4	-0.6	1.5
97378	10.7S	123.1E	1	MS	34	32	94	0	0.4	-14.3	14.3
98222	17.6N	120.4E	31	M	117	0	0	76	2.2	-5.3	5.7
98553	11.6N	125.4E	6	M	108	0	0	48	1.8	-5.1	5.4

WMO REGION 6:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
01360	61.9N	7.9E	664	MS	121	0	0	58	2.5	6.0	6.5
06605	47.1N	7.1E	1599	S8	121	0	0	5	1.2	-4.6	4.8
06685	47.0N	9.1E	515	MS	121	0	0	2	1.2	7.3	7.4
08912	42.9N	0.8W	1434	MS	222	222	100	0			
08922	42.8N	0.2W	1660	MS	234	234	100	0			
10453	51.8N	10.6E	1142	S8	363	0	0	18	1.7	-4.1	4.4
10850	48.8N	10.7E	457	MS	350	0	0	33	0.5	-5.5	5.5
11116	47.5N	10.8E	870	MS	61	1	2	0	0.7	4.1	4.2
11930	49.2N	20.2E	2633	S7	119	0	0	8	1.7	-4.2	4.5
12510	50.7N	15.7E	1603	S8	121	0	0	20	1.5	-4.8	5.0
13269	44.3N	19.9E	176	MS	119	1	1	0	0.9	8.1	8.1
13289	44.1N	21.9E	1037	8	120	2	2	75	1.9	-4.6	5.0
14554	44.9N	18.4E	136	S	60	5	8	0	1.5	-13.2	13.3
16538	40.1N	9.3E	1022	S	27	0	0	48	1.0	9.2	9.3
17203	38.9N	40.5E	1177	S8	120	0	0	0	1.5	6.5	6.7
37788	40.1N	44.4E	854	M	119	5	4	0	3.6	4.9	6.1

ANTARCTIC:

STATION	LAT	LONG	HT(M)	RP	NOBS	NGE	PGE	%REJ	SD	BIAS	RMS
89004	71.7S	2.8W	815	MS	92	0	0	0	0.9	-5.2	5.3
89253	63.2S	55.4W	75	M	239	0	0	0	1.5	4.3	4.6
89257	75.4S	59.9W	40	S	758	0	0	0	1.1	-4.6	4.7
89263	66.0S	66.1W	20	M	242	104	43	0	7.2	0.1	7.2
89264	71.4S	68.9W	780	S	221	2	1	0	0.8	8.3	8.3
89266	72.2S	60.2W	91	S	256	256	100	0			
89272	75.0S	70.8W	1395	S	263	263	100	0			
89327	73.2S	127.1W	230	S	260	77	30	0	3.6	1.2	3.8
89637	69.5S	130.0E	2560	S	305	194	64	25	0.9	13.5	13.5
89661	73.1S	169.6E	200	S	28	0	0	46	2.1	7.0	7.3
89666	76.7S	163.0E	200	S	23	23	100	9			
89744	74.0S	43.1E	3353	S	280	0	0	0	0.7	7.7	7.7

TABLE 4A

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: December 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :300.0 - 150.0 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB: All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

		TEMPERATURE						WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	3169	1	39	1.6	0.1	3160	0	38	0	7.4	0.3
AAL	6096	1	37	1.6	0.1	5949	0	37	0	7.3	0.2
AAR	1364	0	7	2.0	-0.6	1367	1	8	0	8.8	0.5
ACA	4045	0	16	1.6	-0.4	3736	0	17	0	7.8	0.5
ACI	52	0	54	1.0	-0.1	53	0	53	0	5.3	-0.5
AEA	934	0	3	1.6	0.3	523	1	4	0	7.5	0.2
AEL	674	1	8	1.8	-0.3	538	0	7	0	7.4	0.3
AFL	536	1	4	1.7	0.5	451	0	4	0	8.0	1.0
AFR	2258	1	8	1.7	0.2	1763	0	8	0	8.0	0.6
AIS	353	1	9	2.1	-0.6	306	1	8	0	8.1	0.5
AJM	410	0	2	1.5	-0.2	324	0	1	0	6.5	1.0
AJX	252	0	8	1.7	0.3	256	0	10	0	9.8	-0.6
AMM	141	0	5	1.4	0.0	116	0	7	0	8.4	0.2
AMT	1330	0	44	1.5	0.2	1333	0	44	0	7.7	-0.3
AMX	358	0	4	1.6	0.1	263	0	76	0	9.6	1.0
ANA	416	0	8	1.6	0.2	415	0	8	0	7.0	0.1
ANZ	4728	0	27	1.2	0.2	4706	0	27	0	6.3	0.5
ATN	66	0	67	4.5	-2.8	66	0	29	0	12.0	1.5
AUA	25	0	8	2.1	0.3	25	0	8	0	7.2	1.4
AVA	276	1	7	1.8	0.7	169	1	8	0	7.2	0.0
AVN	133	2	46	1.3	0.5	132	0	46	0	5.7	0.0
AXF	22	0	23	0.8	-0.1	22	0	23	0	8.2	-1.4
AZA	419	1	47	2.0	-0.1	327	0	5	0	8.7	0.3
BAL	219	0	4	1.7	-0.1	186	0	3	0	6.5	0.5
BAW	853	1	9	1.8	-0.3	764	0	8	0	7.0	0.6
BBR	198	2	7	1.7	0.8	113	0	7	0	10.1	-0.3
BHP	32	0	0	1.3	-0.7	29	3	3	0	6.1	-1.5
BMA	40	3	3	1.4	0.0	43	0	0	0	5.2	-1.0
BSK	55	0	20	1.8	0.4	58	0	19	0	9.5	0.6
BWA	359	1	6	1.7	0.4	266	0	8	0	7.2	0.3
CAL	57	0	5	2.0	-0.7	59	0	14	0	8.8	1.1
CCA	287	1	19	2.5	0.2	325	1	100	0	13.1	-0.2
CES	423	0	7	1.8	0.3	429	1	9	0	9.9	0.4
CFC	23	0	4	1.4	0.0	23	0	4	0	6.4	2.5
CFG	1007	0	4	1.7	-0.6	862	0	5	0	7.2	0.4
CGA	147	0	1	1.2	-0.4	138	0	1	0	4.9	0.7
CGF	31	0	3	1.6	-0.8	29	0	3	0	4.9	2.1
CGH	128	0	2	1.3	-0.4	121	0	2	0	4.4	0.2
CKS	460	0	67	1.9	0.5	461	0	46	0	10.0	0.5
CLX	394	0	5	1.5	-0.4	304	0	7	0	6.8	-0.2
CMI	93	2	24	1.3	0.2	97	0	20	0	6.0	0.3
COA	660	1	46	1.4	-0.3	633	0	46	0	7.1	0.5
CPA	24	0	8	0.9	0.5	24	0	8	0	4.8	-0.6
CRL	605	1	6	1.9	0.4	423	0	5	0	8.6	0.3
CSN	182	1	9	2.1	-0.7	184	0	14	0	9.1	0.0
CUB	315	11	50	2.9	1.3	252	0	10	0	9.2	-0.2
DAB	323	0	3	1.3	-0.4	308	0	3	0	5.2	0.8
DAI	231	0	2	1.2	0.0	215	0	2	0	4.9	0.8
DAL	2690	0	40	1.4	-0.2	2654	0	41	0	7.3	0.2
DBR	51	0	0	1.3	-0.6	51	0	0	0	5.8	2.2
DCE	189	0	6	1.4	-0.2	170	0	9	0	8.3	-0.2
DHL	87	0	100	6.1	-5.5	84	0	87	0	9.3	2.6
DLH	1394	1	10	1.4	0.0	1280	0	11	0	6.6	1.0
ECI	27	4	19	2.2	-0.2	22	0	18	0	6.5	1.4
EDW	97	2	4	1.3	-0.4	78	0	1	0	6.1	1.0
EEZ	42	2	14	2.1	-0.1	33	0	9	0	4.7	0.2
EFF	20	0	5	1.8	1.2	21	0	14	0	11.0	-0.2
EIA	435	1	100	2.9	0.8	424	0	100	0	15.8	3.6
ELY	152	0	2	1.5	-0.5	144	0	4	0	7.8	-0.5

		TEMPERATURE					WIND			
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
ETH	27	0	4	1.4	0.1	26	0	12	0	8.9	-0.9
EVA	84	0	11	1.3	-0.5	94	0	11	0	6.4	-0.8
EWW	49	0	4	1.4	0.0	50	0	8	0	12.1	4.2
FDX	1844	0	41	1.4	0.3	1831	0	42	0	7.7	0.4
FGS	246	0	2	1.5	0.1	236	0	2	0	5.9	1.0
FGZ	138	0	2	1.3	-0.3	128	0	2	0	4.1	0.7
FIN	176	1	3	1.4	0.2	165	0	5	0	7.3	0.5
FJI	1060	1	49	1.3	0.4	1041	0	49	0	7.5	0.3
FOM	734	0	31	1.4	0.1	729	0	31	0	6.0	0.6
FWQ	47	4	51	1.2	-0.6	47	0	49	0	8.6	-1.1
GCO	449	0	27	1.7	-0.3	452	1	28	0	8.2	0.8
GHA	100	0	3	1.7	-0.3	76	0	5	0	11.9	0.3
GOJ	48	0	0	1.6	-0.3	42	0	0	0	6.5	1.9
GRL	72	0	1	1.5	-0.4	65	0	0	0	4.7	0.4
GTI	306	2	13	1.6	-0.2	303	0	13	0	7.1	0.0
GVA	35	0	0	1.4	-0.1	33	0	0	0	5.2	0.8
GVB	39	0	3	1.5	0.0	39	0	3	0	4.9	1.2
GVF	35	0	0	1.8	-1.2	35	0	0	0	5.2	1.2
GVG	31	0	0	1.5	-0.4	31	0	0	0	5.2	0.4
GVH	42	0	0	1.5	-0.7	41	0	0	0	5.0	0.9
GVL	37	0	3	1.7	-0.2	36	0	0	0	4.8	-0.2
GVR	126	0	0	1.2	-0.1	122	0	0	0	4.9	0.9
GVT	35	0	0	1.3	-0.3	34	0	0	0	4.2	0.2
GVW	29	0	7	1.2	-0.3	26	0	8	0	4.8	1.2
GVX	33	0	6	1.3	0.2	30	0	3	0	4.5	0.2
GWW	40	0	0	1.5	-0.7	38	0	0	0	4.1	1.0
GYM	35	0	0	1.5	-0.6	33	0	0	0	4.8	1.5
HAL	5369	1	39	1.5	-0.2	5356	0	40	0	8.5	0.3
HRH	67	0	70	1.9	1.7	67	1	72	0	8.8	-0.2
IBE	3147	1	5	1.6	0.4	1969	0	6	0	8.1	0.3
ICE	616	0	3	1.5	-0.1	597	0	4	0	6.2	0.3
IWD	252	1	5	1.5	-0.1	180	1	4	0	6.8	0.4
JAA	142	1	7	1.9	1.0	140	0	4	0	5.9	1.9
JAL	2791	1	5	1.7	0.2	2793	0	6	0	8.4	0.2
JAZ	1052	1	6	1.6	0.6	1057	0	7	0	7.7	0.4
JBU	36	0	0	0.7	0.0	37	0	0	0	4.0	0.0
JMC	108	0	5	1.6	0.2	86	0	8	0	8.7	1.7
KAI	24	0	38	2.8	2.0	24	0	42	0	9.8	0.9
KAL	3317	1	11	1.8	-0.3	3311	0	12	0	8.5	0.5
KLM	2169	1	5	1.6	0.1	1834	0	5	0	7.4	0.3
LAN	558	0	6	1.8	-0.2	550	0	6	0	6.6	1.3
LAP	39	5	10	1.6	0.7	38	0	8	0	8.0	2.0
LDI	592	0	33	1.6	-0.8	431	0	3	0	7.6	0.3
LIB	643	1	6	1.9	1.3	418	0	7	0	8.3	0.6
LOT	83	0	5	1.9	-1.0	78	0	5	0	7.5	0.7
LTU	679	1	6	1.7	-0.1	582	0	6	0	7.3	0.1
LXR	37	0	14	2.4	0.6	21	0	14	0	11.9	0.6
MAS	239	0	3	1.7	-0.4	232	0	6	0	8.1	0.2
MON	57	0	2	1.6	0.0	40	0	0	0	6.3	1.6
MPD	317	0	5	1.8	0.4	214	0	7	0	7.5	-0.1
MPH	685	0	3	1.8	-0.9	615	0	4	0	7.5	0.1
MYT	291	0	3	1.8	0.2	242	0	2	0	7.1	0.1
NCA	1011	0	4	1.8	0.1	774	0	5	0	7.1	0.3
NGA	52	0	0	1.1	-0.4	38	0	5	0	11.7	-2.7
NWA	9411	1	11	1.7	0.0	9369	0	11	0	8.0	0.3
NZL	3429	0	11	1.3	0.3	3429	0	11	0	5.4	0.7
OAE	301	0	39	1.5	0.0	300	1	43	0	9.0	1.7
PAC	818	1	23	2.0	0.1	823	0	22	0	7.7	0.1
PAL	1468	1	13	1.7	-0.4	1418	0	15	0	8.9	0.6

IDENT.	TEMPERATURE N.REP.	PG	PR	RMS	BIAS	WIND N.REP.	PG	PR	PC	RMS	BIAS
PAO	390	0	61	1.6	0.7	390	0	60	0	5.8	0.6
QFA	2687	0	46	1.3	0.4	2690	0	46	0	5.9	0.1
RAM	261	3	8	1.7	-0.1	161	1	73	0	9.9	0.8
RCH	231	6	100	3.5	0.8	199	0	72	0	12.2	0.7
RJA	32	9	19	2.3	0.3	33	0	9	0	7.4	1.0
RRR	38	3	11	1.4	0.3	38	0	13	0	10.3	1.2
RYN	182	0	100	3.5	-1.3	181	0	44	0	6.4	-0.3
RZO	356	1	4	1.8	-0.3	149	1	5	0	8.2	0.9
SAA	410	1	2	1.4	-0.6	328	0	4	0	8.0	-0.2
SEU	56	2	11	1.8	0.2	43	0	14	0	9.9	0.7
SIA	333	0	0	1.2	0.1	335	0	0	0	5.2	0.5
SLR	190	0	4	1.4	-0.2	172	1	9	0	9.6	0.4
SOO	42	17	52	3.2	1.6	43	0	26	0	6.5	-0.7
SQC	30	0	7	1.5	0.5	30	0	10	0	5.3	0.5
SSV	22	5	18	1.0	0.1	22	0	18	0	7.3	0.3
SVA	22	0	14	2.8	0.3	26	0	8	0	4.9	1.2
TAG	25	0	20	2.7	0.3	25	0	20	0	7.8	0.8
TAP	684	1	3	1.6	-0.3	271	1	4	0	8.0	0.5
TCV	44	0	2	1.5	0.9	29	0	7	0	10.3	-0.6
THA	182	0	6	1.5	-0.1	185	1	8	0	6.7	0.9
THT	178	0	26	1.8	0.2	169	0	25	0	7.9	0.6
TPA	26	0	0	1.1	0.4	23	0	4	0	8.5	-1.0
TSC	58	0	14	1.5	0.0	54	0	15	0	6.8	0.2
UAL	208786	0	95	1.3	-0.3	209227	0	95	0	5.3	0.5
UPS	1553	1	51	1.7	0.2	1525	0	51	0	7.0	0.7
USA	217	4	6	1.5	0.0	184	0	4	0	9.0	0.0
VIR	243	0	1	1.4	-0.1	230	0	3	0	7.7	0.9
VRG	123	2	11	2.4	0.8	125	0	10	0	10.8	1.1
VVR	126	10	40	2.6	0.9	127	0	31	0	8.9	0.8
WOA	269	0	5	1.6	0.1	281	1	9	0	9.0	1.6
YSS	65	0	8	1.8	1.0	44	0	11	0	7.3	0.3
ZKN	30	0	0	1.3	-0.4	29	0	0	0	5.5	-0.8
9VS	163	0	1	1.5	-0.1	157	0	1	0	4.9	0.1
AR	1520	0	100	3.1	2.9	1495	0	4	0	6.1	1.4
AU	40081	0	11	1.2	0.5	40090	0	12	0	5.3	0.5
EU	126719	0	25	1.2	0.1	126719	0	25	0	4.6	0.5
KL	1864	0	14	1.2	0.5	1854	0	14	0	5.2	0.9
LH	2099	0	12	1.7	1.2	2086	0	12	0	5.1	0.7
LN	44	0	41	1.8	-0.5	44	0	48	0	12.6	0.4
MK	3542	0	86	2.5	2.2	3532	0	6	0	6.8	1.2
SA	4503	0	9	1.8	1.3	4501	0	5	0	6.3	0.7
TN	44	0	39	2.0	0.7	43	0	37	0	5.8	2.2
N	2785	1	19	1.7	0.2	2748	0	19	0	6.6	0.8
ACARS	978897	0	62	1.4	0.2	978883	0	61	0	5.5	0.6

TABLE 4B

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: December 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Statistics for each airline carrier.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :All hours combined.

Level(s) monitored :1000.0 – 300.1 hPa

Elements monitored :TEMP in °C ; WIND in m s^{-1}

Parameters monitored

:N REP. :Number of observations received excluding duplicates.

:PG :Percentage of observations with gross errors.

:PR :Percentage of observations rejected by quality control including rejections from the duplicate check.

:PC :Percentage of observations with calm winds.

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.

:BIAS :Mean difference of observations from background values excluding those with gross errors in Temperature & Wind Speed.

GROSS ERROR LIMITS :10.0 °C ; 60 m s^{-1} Vector Wind

SELECTION CRITERIA :N REP $\geq$ 20

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS".

		TEMPERATURE					WIND				
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAH	28	4	32	1.7	-0.9	28	0	29	0	8.7	-2.0
AAL	705	1	42	1.5	-0.1	678	0	42	0	7.9	1.2
ACI	27	0	56	0.9	-0.1	27	0	56	0	4.1	-0.4
AFL	20	0	5	2.5	1.3	20	0	5	0	7.7	0.4
AFR	84	1	8	1.9	0.3	76	0	4	0	6.3	1.2
AMT	48	0	44	1.0	0.0	47	0	45	0	6.8	1.3
ANZ	236	1	26	1.2	-0.1	237	0	26	0	6.6	0.1
ATN	48	0	65	4.1	-1.2	50	0	8	0	7.7	1.6
AXF	34	6	68	1.3	-0.3	34	0	65	0	8.2	2.6
AZA	24	0	29	1.1	0.1	28	0	11	0	6.4	0.9
BAF	22	5	5	0.8	0.0	23	0	0	0	5.6	0.5
CFC	98	2	3	1.2	0.2	72	0	6	0	9.4	1.8
CFG	49	0	4	1.5	-0.8	44	0	5	0	6.3	1.6
CIU	32	6	13	2.2	1.1	25	0	8	0	9.8	1.5
CLX	29	0	17	2.2	-1.0	28	0	18	0	4.6	0.8
CMI	25	0	44	1.9	-0.7	25	0	40	0	4.6	0.8
COA	53	0	42	2.2	-0.4	54	0	41	0	6.6	2.0
CRL	26	4	27	1.9	0.5	23	0	39	0	16.5	-2.2
CUB	48	2	29	2.6	0.6	33	0	3	0	9.0	2.1
DAL	285	0	47	1.3	-0.1	280	0	48	0	6.7	1.2
DHL	55	0	100	6.7	-6.6	51	0	78	0	15.8	3.8
DLH	221	1	14	1.2	0.1	223	0	14	0	6.9	0.8
EIA	26	4	100	1.3	0.7	24	0	100	0	20.4	2.4
FDX	550	0	35	1.2	0.3	535	0	37	0	7.7	1.1
FIN	25	0	12	0.9	0.3	24	0	17	0	9.7	0.1
FJI	21	14	52	1.4	0.8	21	5	48	0	10.8	2.9
GAF	25	0	0	1.1	0.0	23	0	4	0	10.2	0.2
GCO	153	2	23	1.3	-0.1	156	0	21	0	7.1	1.8
HAL	454	0	43	1.6	-0.1	454	0	43	0	9.0	1.2
IBE	52	6	13	1.4	0.2	40	3	18	0	11.6	-1.0
JAA	54	0	9	1.6	0.4	54	0	9	0	7.0	0.6
JAL	123	0	5	1.6	-0.1	123	1	6	0	7.4	0.2
JAZ	200	0	8	1.7	0.8	197	1	8	0	6.9	-0.3
KAL	42	0	19	1.9	-0.9	44	0	18	0	5.7	0.1
KIW	61	3	16	4.0	1.0	99	2	13	0	11.6	-0.4
KLM	168	1	2	1.2	0.0	157	1	6	0	8.9	1.3
LAN	28	0	7	0.9	0.4	29	0	10	0	9.8	2.4
LIB	146	1	8	2.0	1.2	113	0	6	0	8.7	0.6
MPH	89	0	6	1.3	-0.4	82	0	7	0	7.4	0.6
NCA	69	0	0	1.9	-0.1	56	0	2	0	6.9	-1.4
NWA	364	1	15	1.5	-0.1	359	0	15	0	8.2	-0.9
NZL	17774	0	54	1.4	0.5	17774	0	54	0	4.8	-0.2
PAC	55	0	16	1.8	-0.1	55	0	22	0	12.0	-0.5
PAL	66	0	27	1.4	-0.9	64	0	30	0	5.4	1.2
QFA	180	4	52	1.5	0.2	179	1	51	0	6.7	1.2
RCH	59	3	100	3.5	-1.9	53	0	66	0	12.2	3.3
RRR	98	5	14	1.8	0.7	100	1	13	0	7.8	0.3
RYN	26	0	100	4.7	-1.7	26	0	42	0	6.7	0.7
SIA	59	0	0	1.0	0.2	60	0	2	0	4.7	-0.2
SKI	23	9	22	3.4	0.1	75	3	29	0	16.9	1.7
UAL	460790	0	98	1.2	-0.1	460288	0	98	0	4.5	0.3
UPS	207	0	49	1.5	0.1	199	0	50	0	9.0	0.3
VTA	25	4	48	2.4	-1.8	34	0	32	0	5.6	1.4
VVP	25	4	32	3.9	-1.7	26	0	15	0	11.1	0.1
WOA	58	3	3	1.4	0.3	57	0	9	0	9.6	2.9
AR	1094	0	100	2.0	1.4	1096	0	49	0	4.9	0.7

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AU	29955	0	52	1.4	0.4	30058	0	52	0	4.3	0.1
EU	458486	0	66	1.1	0.2	456492	0	66	0	3.9	0.1
KL	942	0	50	1.4	0.8	931	0	50	0	4.4	0.6
LH	1025	0	62	1.1	0.5	1022	0	62	0	3.8	0.8
MK	2356	0	91	1.6	1.1	2356	0	52	0	4.2	0.5
SA	3386	0	60	1.8	0.5	3383	0	57	0	5.0	0.1
N	49	0	20	2.1	0.1	50	0	34	0	12.6	1.6
ACARS	1944273	0	78	1.2	0.3	1938824	0	78	0	4.6	0.2

Figure 3a. AIRCRAFT 300 - 150 hPa mean daily count. DECEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 47087

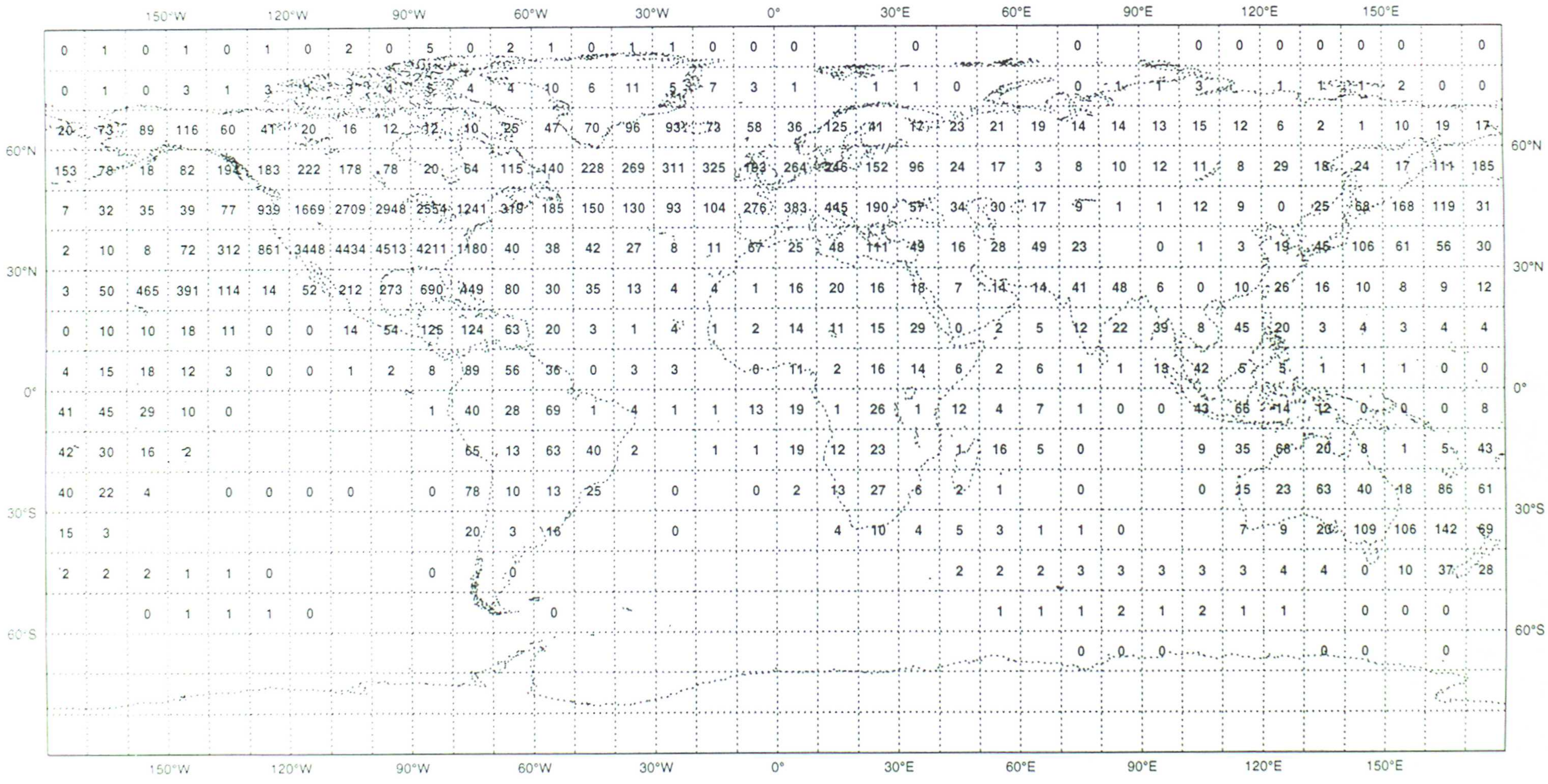

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 1 0 1 0 1 0 2 0 5 0 2 1 0 1 1 0 0 0 0 0 0 0 0 0 0 0 0
0 1 0 3 1 3 3 4 5 4 4 10 6 11 5 7 3 1 1 1 0 0 1 1 3 1 1 1 2 0 0
20 73 89 116 60 41 20 16 12 12 10 25 47 70 96 93 73 58 36 125 41 12 23 21 19 14 14 13 15 12 6 2 1 10 19 17
153 78 18 82 194 183 222 178 78 20 64 115 140 228 269 311 325 193 264 246 152 96 24 17 3 8 10 12 11 8 29 18 24 17 111 185
7 32 35 39 77 939 1669 2709 2948 2554 1241 319 185 150 130 93 104 276 383 445 190 57 34 30 17 9 1 1 12 9 0 25 68 168 119 31
2 10 8 72 312 861 3448 4434 4513 4211 1180 40 38 42 27 8 11 67 25 48 141 49 16 28 49 23 0 1 3 19 45 106 61 56 30
3 50 465 391 114 14 52 212 273 690 449 80 30 35 13 4 4 1 16 20 16 18 7 14 14 41 48 6 0 10 26 16 10 8 9 12
0 10 10 18 11 0 0 14 54 125 124 63 20 3 1 4 1 2 14 11 15 29 0 2 5 12 22 39 8 45 20 3 4 3 4 4
4 15 18 12 3 0 0 1 2 8 89 56 36 0 3 3 0 11 2 16 14 6 2 6 1 1 13 42 5 5 1 1 1 0 0
41 45 29 10 0 1 40 28 69 1 4 1 1 13 19 1 26 1 12 4 7 1 0 0 43 66 14 12 0 0 0 8
42 30 16 2 65 13 63 40 2 1 1 19 12 23 1 16 5 0 9 35 68 20 8 1 5 43
40 22 4 0 0 0 0 0 78 10 13 25 0 0 2 13 27 6 2 1 0 0 15 23 63 40 18 86 61
15 3 20 3 16 0 4 10 4 5 3 1 1 0 7 9 20 109 106 142 69
2 2 2 1 1 0 0 0 2 2 2 3 3 3 3 3 4 4 0 10 37 28
0 1 1 1 0 0 1 1 1 2 1 2 1 1 0 0 0
0 0 0 0 0 0

Figure 3b. AIRCRAFT 1000 - 301 hPa mean daily count. DECEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Global average number of observations in 24 hours = 94121

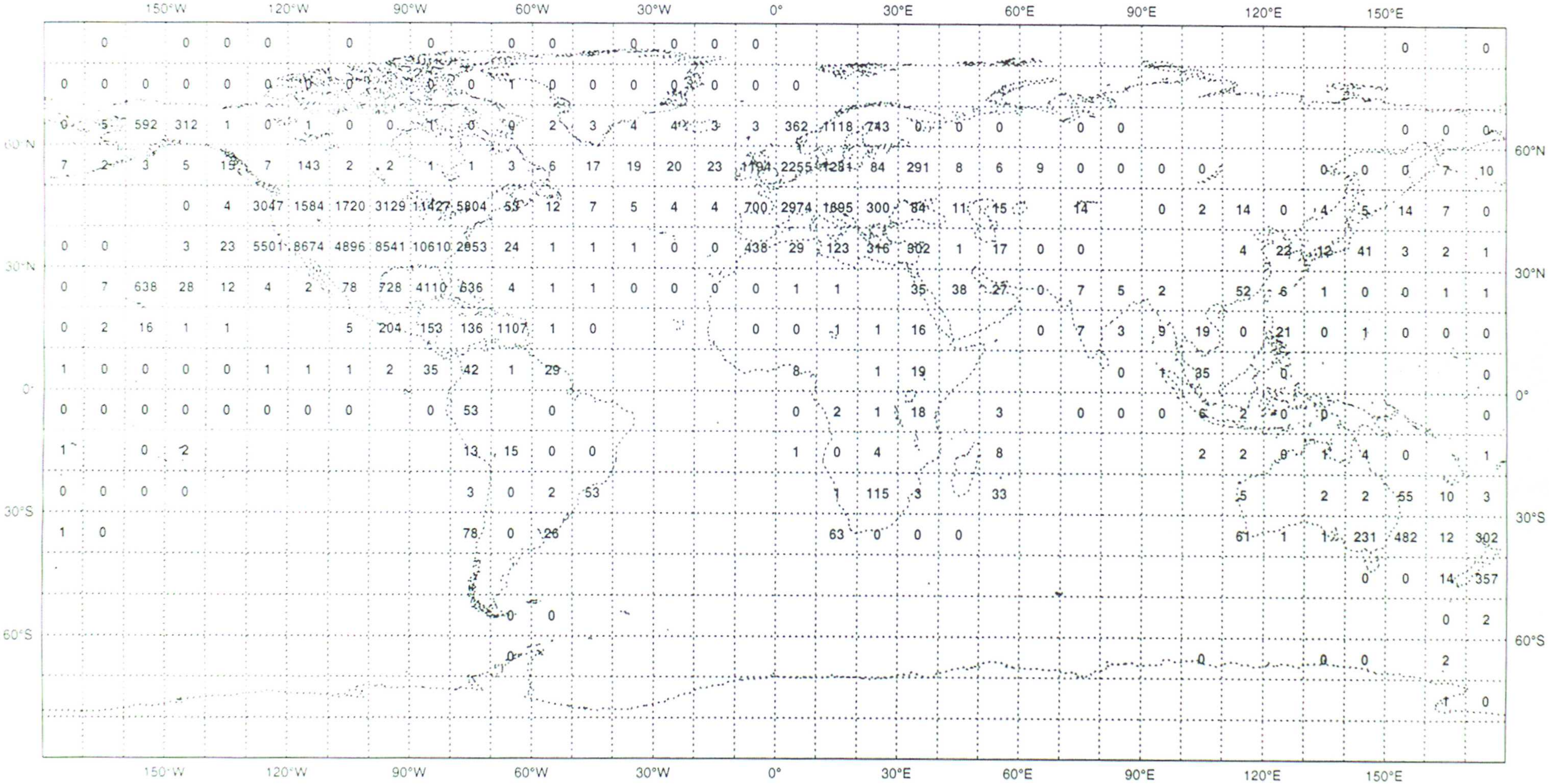

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0
0 5 592 312 1 0 1 0 0 1 0 0 2 3 4 4 3 3 362 1118 743 0 0 0 0 0 0 0 0
7 2 3 5 19 7 143 2 2 1 1 3 6 17 19 20 23 1194 2255 1281 84 291 8 6 9 0 0 0 0 0 0 0 7 10
0 4 3047 1584 1720 3129 11427 5804 53 12 7 5 4 4 700 2974 1895 300 84 11 15 14 0 2 14 0 4 5 14 7 0
0 0 3 23 5501 8674 4896 8541 10610 2853 24 1 1 1 0 0 438 29 123 316 302 1 17 0 0 4 22 12 41 3 2 1
0 7 638 28 12 4 2 78 728 4110 636 4 1 1 0 0 0 0 1 1 35 38 27 0 7 5 2 52 6 1 0 0 1 1
0 2 16 1 1 5 204 153 136 1107 1 0 0 0 1 1 16 0 7 3 9 19 0 21 0 1 0 0 0
1 0 0 0 0 1 1 1 2 35 42 1 29 8 1 19 0 1 35 0 0
0 0 0 0 0 0 0 0 0 53 0 0 2 1 18 3 0 0 0 6 2 0 0 0
1 0 2 13 15 0 0 1 0 4 8 2 2 0 1 4 0 1
0 0 0 0 3 0 2 53 1 115 3 33 5 2 2 55 10 3
1 0 78 0 26 63 0 0 0 61 1 1 231 482 12 302
0 0 14 357
0 0 0 2
0 0 0 0 2
1 0

Figure 4a. AIRCRAFT 300 - 150 hPa mean winds. DECEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

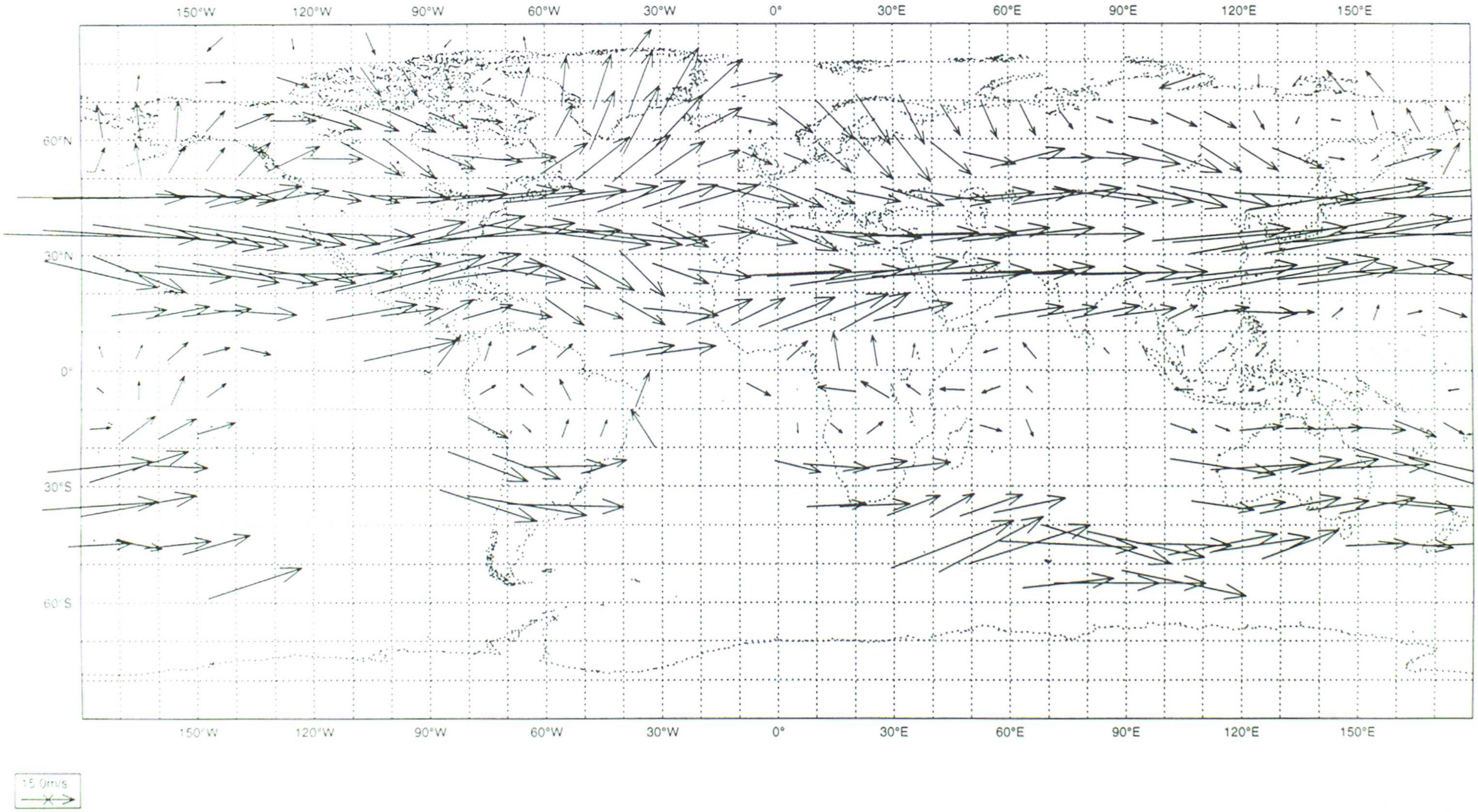

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 4b. AIRCRAFT 1000 - 301 hPa mean winds. **DECEMBER 2002**
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

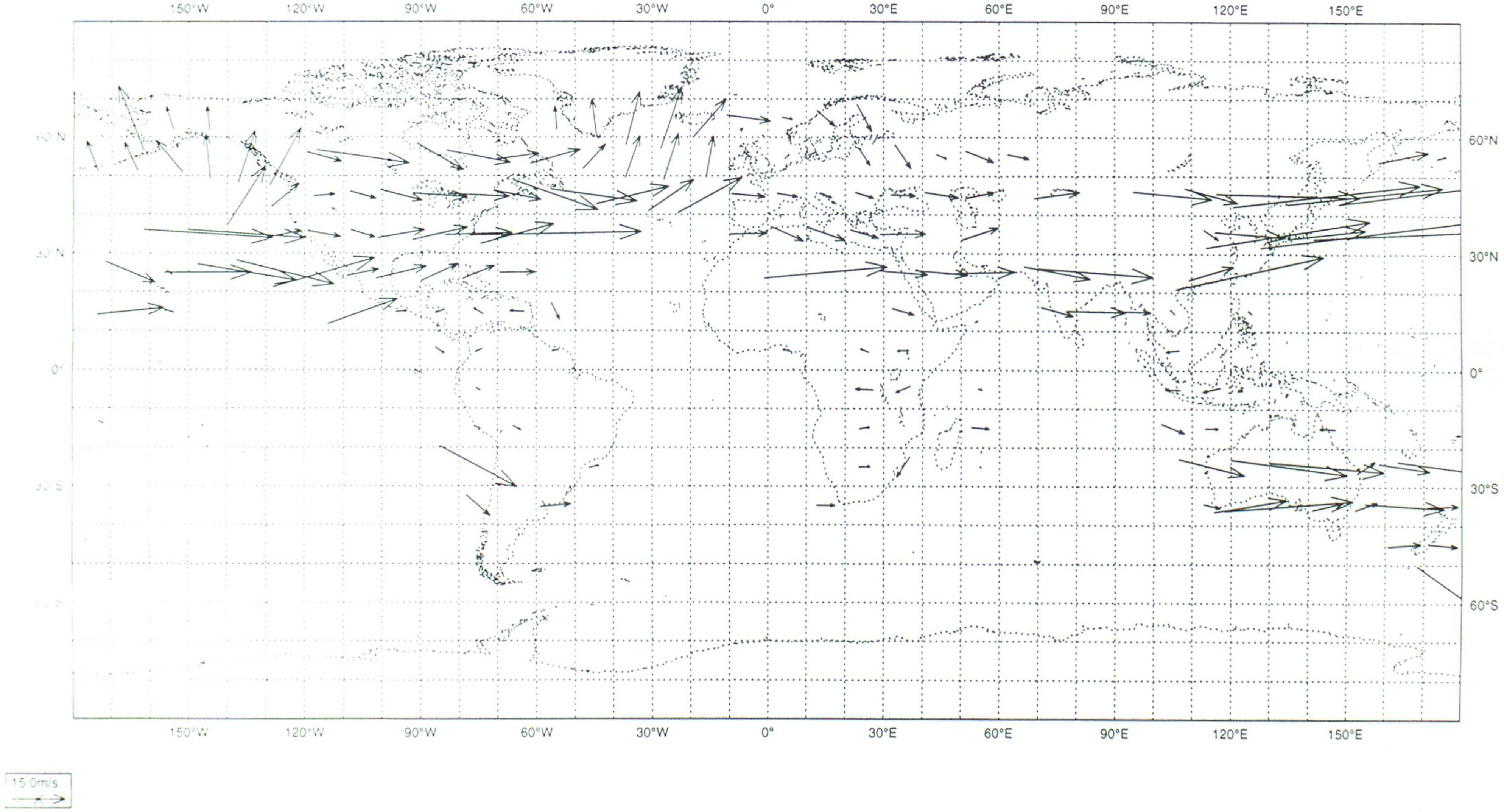

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5a. AIRCRAFT 300 - 150 hPa mean O-B winds. **DECEMBER 2002**
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

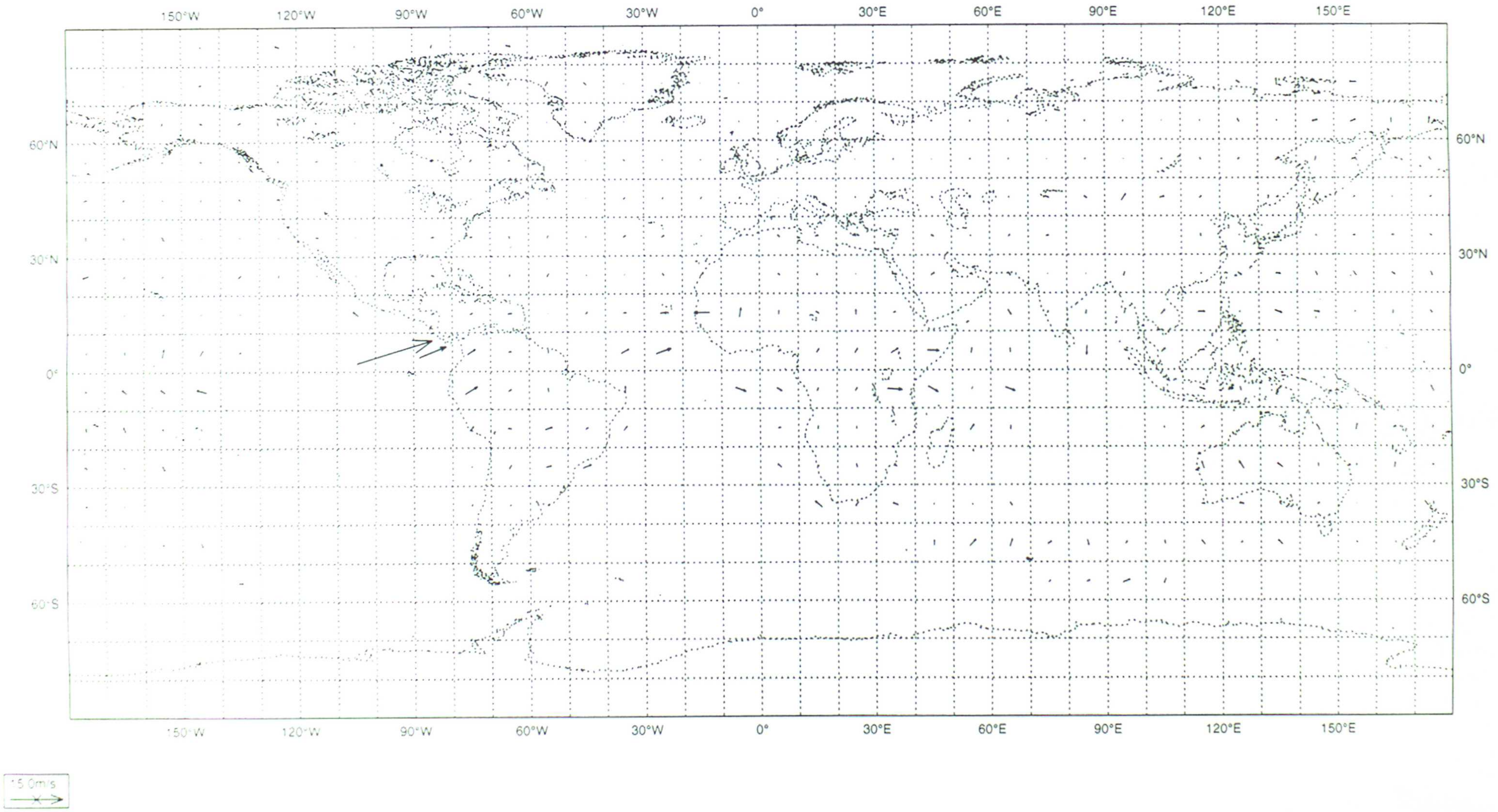

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 5b. AIRCRAFT 1000 - 301 hPa mean O-B winds. DECEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Arrows are plotted where greater than 30 obs are present

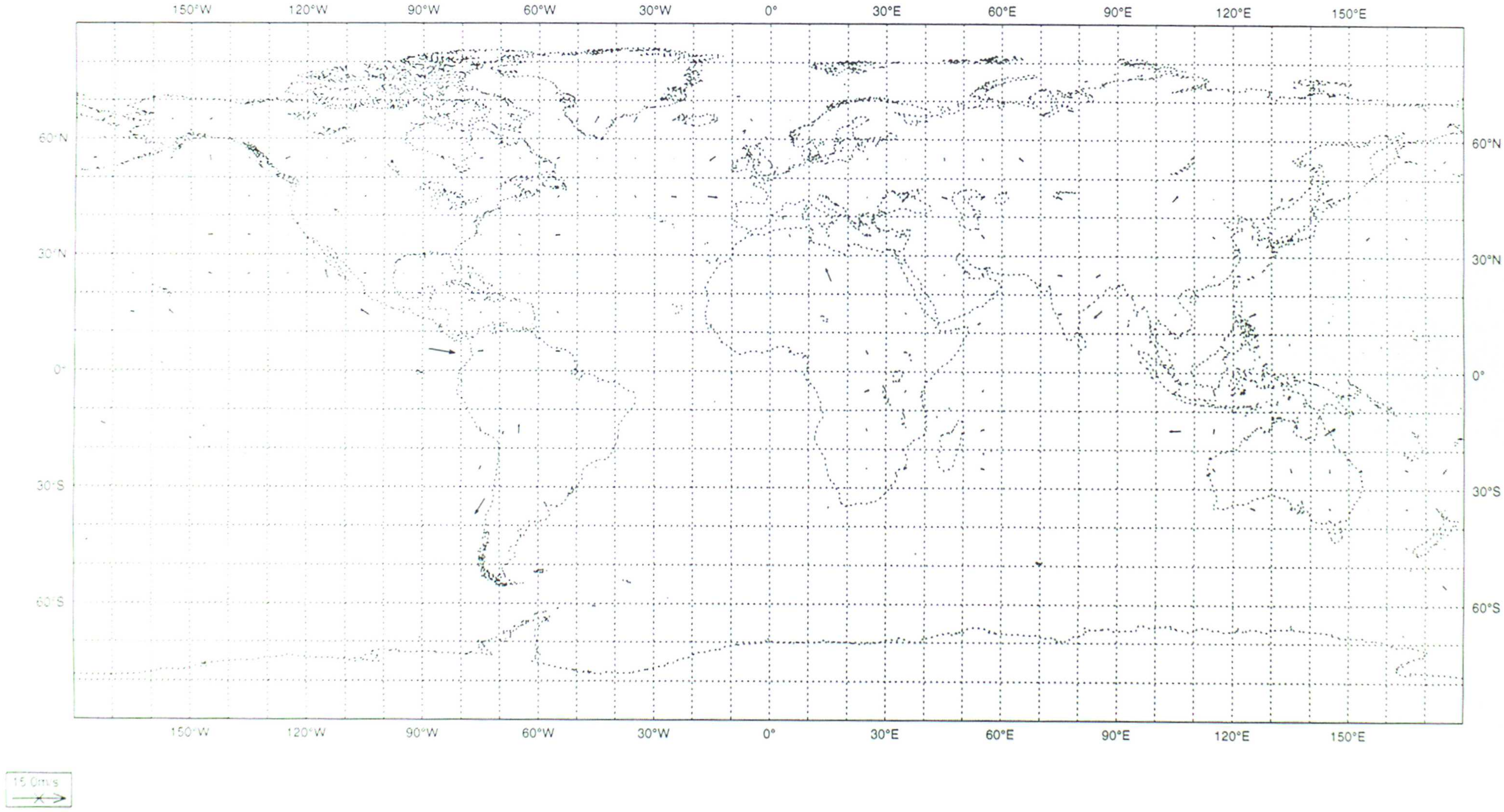

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 6a. AIRCRAFT 300 - 150 hPa mean O-B speeds (ms-1). DECEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

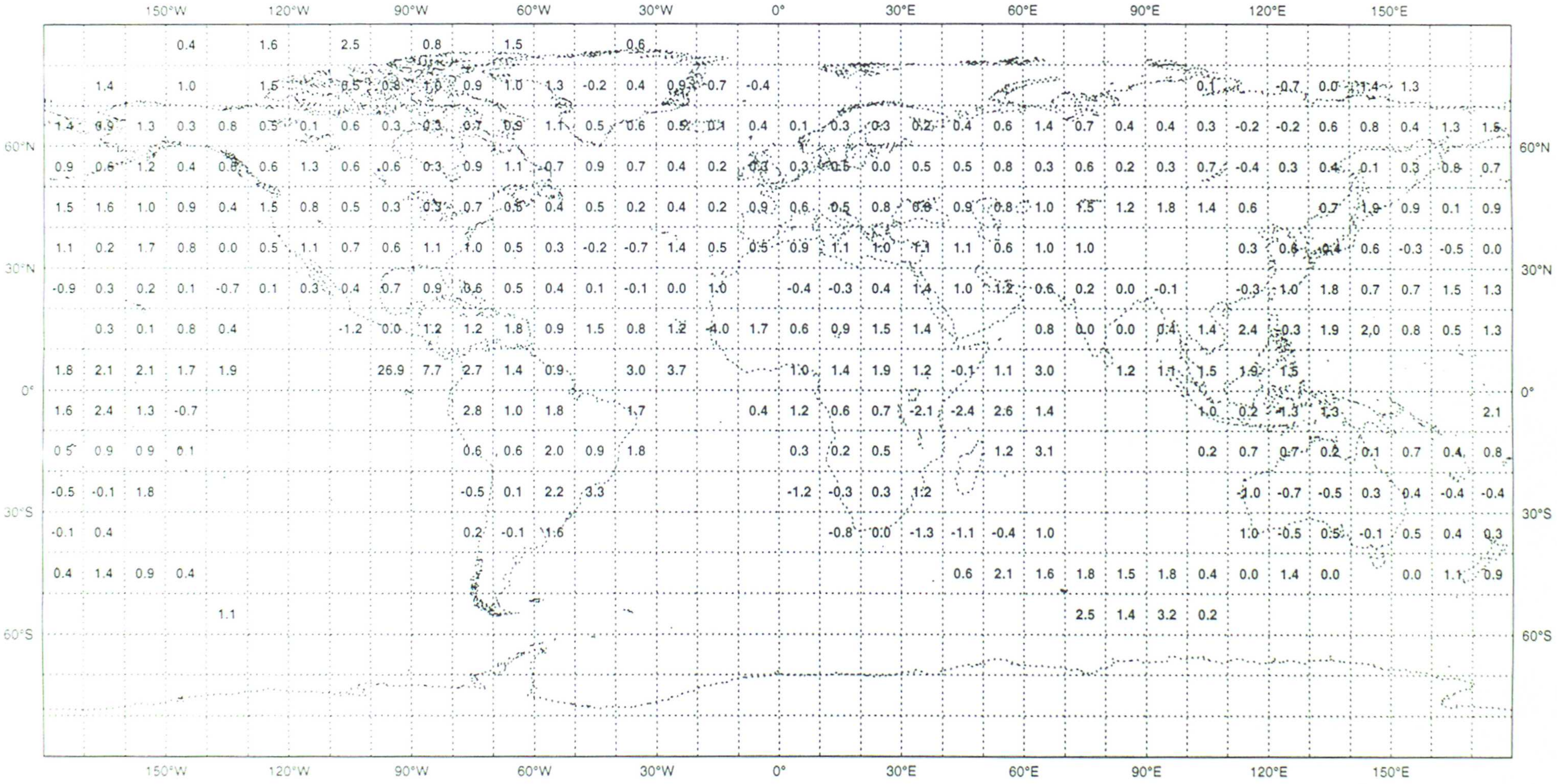

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0.4 1.6 2.5 0.8 1.5 0.6
1.4 1.0 1.5 0.5 0.8 1.0 0.9 1.0 1.3 -0.2 0.4 0.9 -0.7 -0.4 0.1 -0.7 0.0 1.4 1.3
1.4 0.9 1.3 0.3 0.8 0.5 0.1 0.6 0.3 0.3 0.7 0.9 1.1 0.5 0.6 0.5 0.1 0.4 0.1 0.3 0.3 0.2 0.4 0.6 1.4 0.7 0.4 0.4 0.3 -0.2 -0.2 0.6 0.8 0.4 1.3 1.5
0.9 0.6 1.2 0.4 0.8 0.6 1.3 0.6 0.6 0.3 0.9 1.1 0.7 0.9 0.7 0.4 0.2 0.3 0.3 0.5 0.0 0.5 0.5 0.8 0.3 0.6 0.2 0.3 0.7 -0.4 0.3 0.4 0.1 0.3 0.8 0.7
1.5 1.6 1.0 0.9 0.4 1.5 0.8 0.5 0.3 0.3 0.7 0.5 0.4 0.5 0.2 0.4 0.2 0.9 0.6 0.5 0.8 0.8 0.9 0.8 1.0 1.5 1.2 1.8 1.4 0.6 0.7 1.9 0.9 0.1 0.9
1.1 0.2 1.7 0.8 0.0 0.5 1.1 0.7 0.6 1.1 1.0 0.5 0.3 -0.2 -0.7 1.4 0.5 0.5 0.9 1.1 1.0 1.1 1.1 0.6 1.0 1.0 0.3 0.6 0.4 0.6 -0.3 -0.5 0.0
-0.9 0.3 0.2 0.1 -0.7 0.1 0.3 0.4 0.7 0.9 0.6 0.5 0.4 0.1 -0.1 0.0 1.0 -0.4 -0.3 0.4 1.4 1.0 1.2 0.6 0.2 0.0 -0.1 -0.3 1.0 1.8 0.7 0.7 1.5 1.3
0.3 0.1 0.8 0.4 -1.2 0.0 1.2 1.2 1.8 0.9 1.5 0.8 1.2 4.0 1.7 0.6 0.9 1.5 1.4 0.8 0.0 0.0 0.4 1.4 2.4 0.3 1.9 2.0 0.8 0.5 1.3
1.8 2.1 2.1 1.7 1.9 26.9 7.7 2.7 1.4 0.9 3.0 3.7 1.0 1.4 1.9 1.2 -0.1 1.1 3.0 1.2 1.1 1.5 1.9 1.5
1.6 2.4 1.3 -0.7 2.8 1.0 1.8 1.7 0.4 1.2 0.6 0.7 -2.1 -2.4 2.6 1.4 1.0 0.2 1.3 1.3 2.1
0.5 0.9 0.9 0.1 0.6 0.6 2.0 0.9 1.8 0.3 0.2 0.5 1.2 3.1 0.2 0.7 0.7 0.2 0.1 0.7 0.4 0.8
-0.5 -0.1 1.8 -0.5 0.1 2.2 3.3 -1.2 -0.3 0.3 1.2 -1.0 -0.7 -0.5 0.3 0.4 -0.4 -0.4
-0.1 0.4 0.2 -0.1 1.6 -0.8 0.0 -1.3 -1.1 -0.4 1.0 1.0 -0.5 0.5 -0.1 0.5 0.4 0.3
0.4 1.4 0.9 0.4 0.6 2.1 1.6 1.8 1.5 1.8 0.4 0.0 1.4 0.0 0.0 1.1 0.9
1.1 2.5 1.4 3.2 0.2

Figure 6b. AIRCRAFT 1000 - 301 hPa mean O-B speeds (ms-1). **DECEMBER 2002**
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

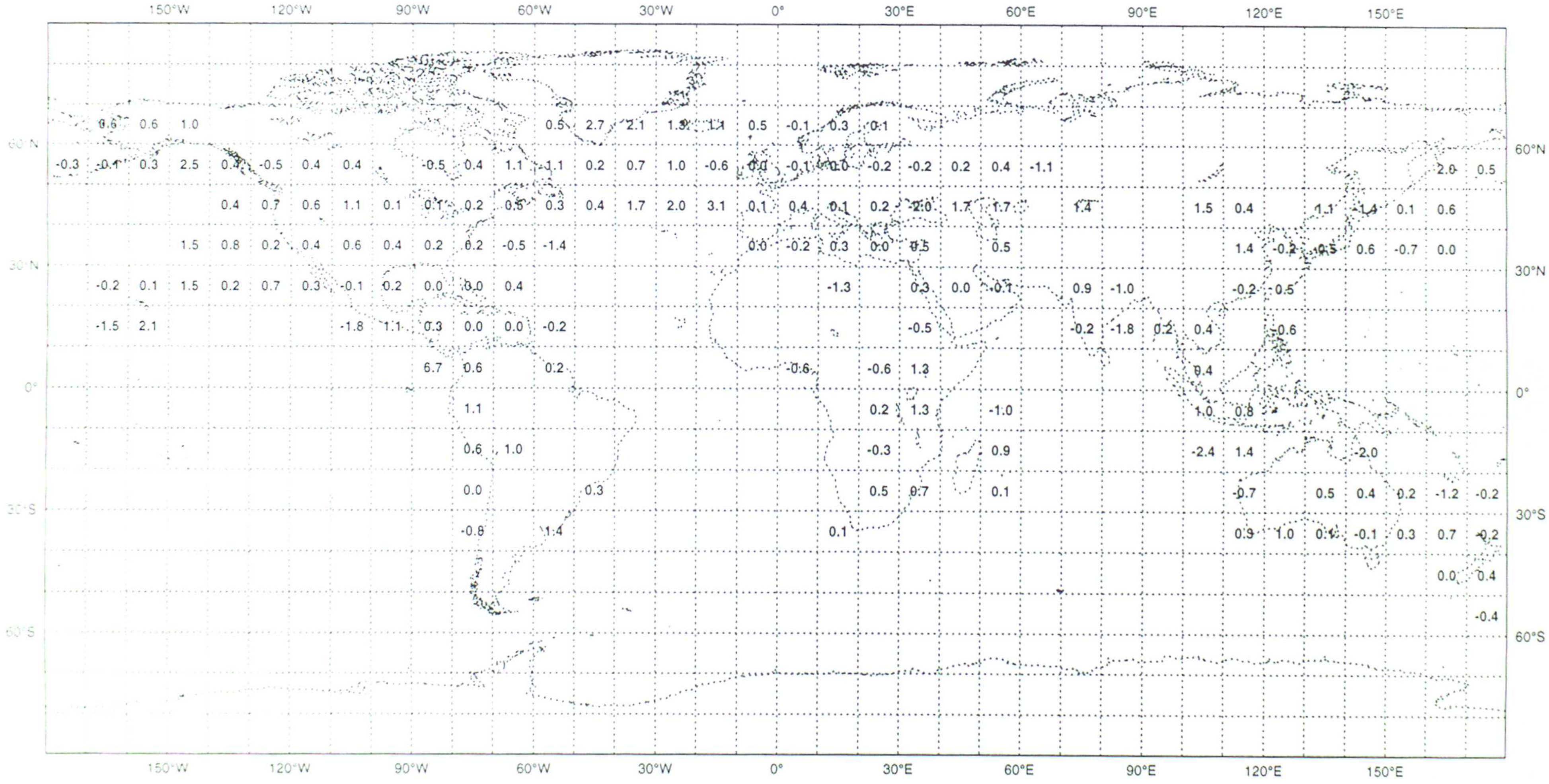

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.6 0.6 1.0 0.5 2.7 2.1 1.3 1.1 0.5 -0.1 0.3 0.1
-0.3 -0.1 0.3 2.5 0.4 -0.5 0.4 0.4 -0.5 0.4 1.1 -1.1 0.2 0.7 1.0 -0.6 0.0 -0.1 0.0 -0.2 -0.2 0.2 0.4 -1.1 2.0 0.5
0.4 0.7 0.6 1.1 0.1 0.1 0.2 0.5 0.3 0.4 1.7 2.0 3.1 0.1 0.4 0.1 0.2 2.0 1.7 1.7 1.4 1.5 0.4 1.1 1.4 0.1 0.6
1.5 0.8 0.2 0.4 0.6 0.4 0.2 0.2 -0.5 -1.4 0.0 -0.2 0.3 0.0 0.5 0.5 1.4 -0.2 0.5 0.6 -0.7 0.0
-0.2 0.1 1.5 0.2 0.7 0.3 -0.1 0.2 0.0 0.0 0.4 -1.3 0.3 0.0 -0.1 0.9 -1.0 -0.2 -0.5
-1.5 2.1 -1.8 1.1 0.3 0.0 0.0 -0.2 -0.5 -0.2 -1.8 0.2 0.4 -0.6
6.7 0.6 0.2 -0.6 -0.6 1.3 0.4
1.1 0.2 1.3 -1.0 1.0 0.8
0.6 1.0 -0.3 0.9 -2.4 1.4 -2.0
0.0 0.3 0.5 0.7 0.1 -0.7 0.5 0.4 0.2 -1.2 -0.2
-0.8 1.4 0.1 0.9 1.0 0.1 -0.1 0.3 0.7 -0.2
0.0 0.4
-0.4

Figure 7a. AIRCRAFT 300 - 150 hPa RMS O-B vector (ms-1). DECEMBER 2002
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

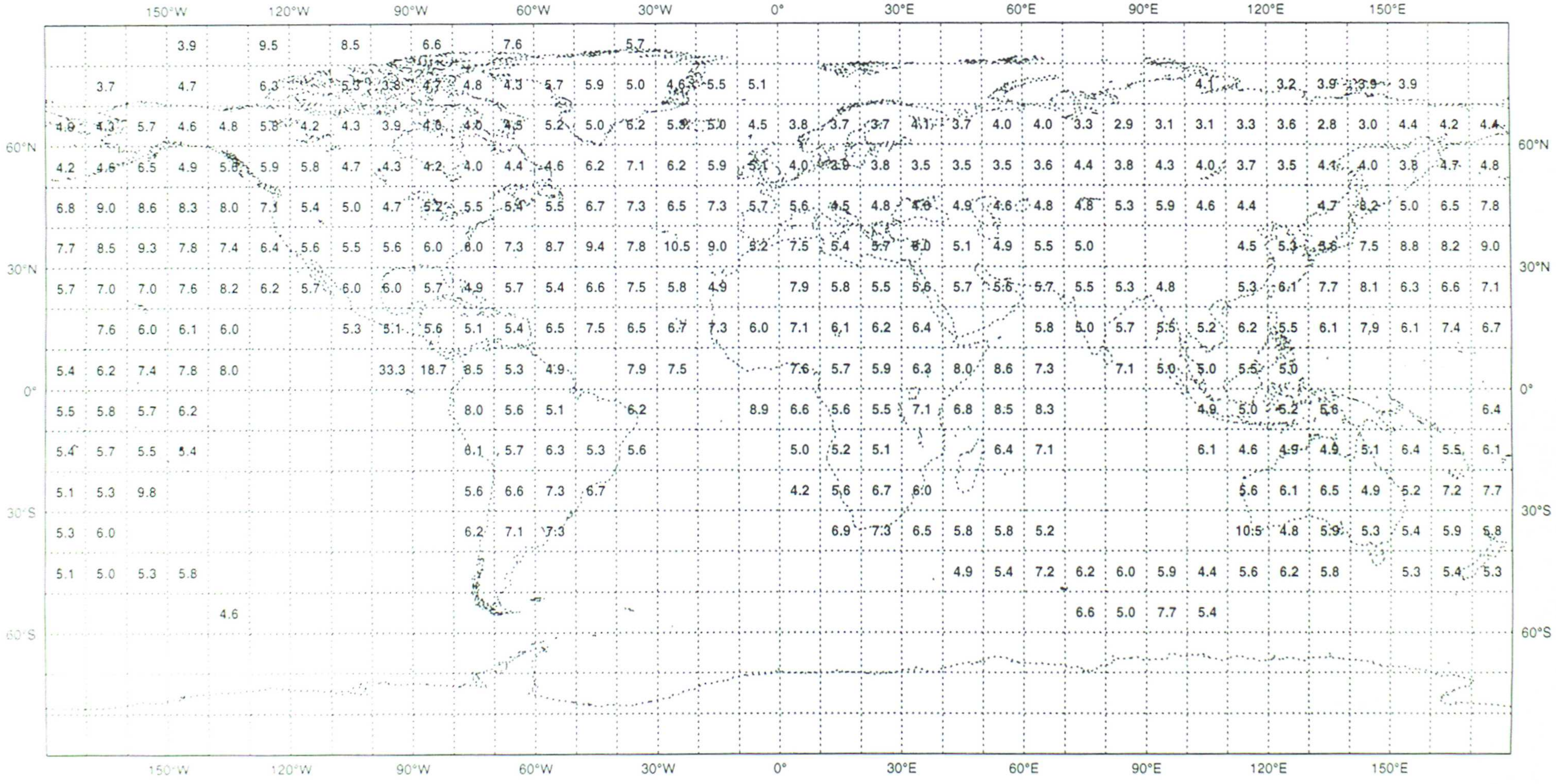

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
3.9 9.5 8.5 6.6 7.6 5.7
3.7 4.7 6.3 5.3 3.8 4.7 4.8 4.3 5.7 5.9 5.0 4.6 5.5 5.1 4.1 3.2 3.9 3.9 3.9
4.9 4.3 5.7 4.6 4.8 5.8 4.2 4.3 3.9 4.0 4.0 4.5 5.2 5.0 6.2 5.9 5.0 4.5 3.8 3.7 3.7 4.1 3.7 4.0 4.0 3.3 2.9 3.1 3.1 3.3 3.6 2.8 3.0 4.4 4.2 4.4
4.2 4.6 6.5 4.9 5.8 5.9 5.8 4.7 4.3 4.2 4.0 4.4 4.6 6.2 7.1 6.2 5.9 5.1 4.0 3.9 3.8 3.5 3.5 3.5 3.6 4.4 3.8 4.3 4.0 3.7 3.5 4.1 4.0 3.8 4.7 4.8
6.8 9.0 8.6 8.3 8.0 7.1 5.4 5.0 4.7 5.2 5.5 5.4 5.5 6.7 7.3 6.5 7.3 5.7 5.6 4.5 4.8 4.6 4.9 4.6 4.8 4.8 5.3 5.9 4.6 4.4 4.7 8.2 5.0 6.5 7.8
7.7 8.5 9.3 7.8 7.4 6.4 5.6 5.5 5.6 6.0 6.0 7.3 8.7 9.4 7.8 10.5 9.0 8.2 7.5 5.4 5.7 6.0 5.1 4.9 5.5 5.0 4.5 5.3 5.6 7.5 8.8 8.2 9.0
5.7 7.0 7.0 7.6 8.2 6.2 5.7 6.0 6.0 5.7 4.9 5.7 5.4 6.6 7.5 5.8 4.9 7.9 5.8 5.5 5.6 5.7 5.6 5.7 5.5 5.3 4.8 5.3 6.1 7.7 8.1 6.3 6.6 7.1
7.6 6.0 6.1 6.0 5.3 5.1 5.6 5.1 5.4 6.5 7.5 6.5 6.7 7.3 6.0 7.1 6.1 6.2 6.4 5.8 5.0 5.7 5.5 5.2 6.2 5.5 6.1 7.9 6.1 7.4 6.7
5.4 6.2 7.4 7.8 8.0 33.3 18.7 8.5 5.3 4.9 7.9 7.5 7.6 5.7 5.9 6.3 8.0 8.6 7.3 7.1 5.0 5.0 5.5 5.0
5.5 5.8 5.7 6.2 8.0 5.6 5.1 6.2 8.9 6.6 5.6 5.5 7.1 6.8 8.5 8.3 4.9 5.0 5.2 5.6 6.4
5.4 5.7 5.5 5.4 6.1 5.7 6.3 5.3 5.6 5.0 5.2 5.1 6.4 7.1 6.1 4.6 4.9 4.9 5.1 6.4 5.5 6.1
5.1 5.3 9.8 5.6 6.6 7.3 6.7 4.2 5.6 6.7 6.0 5.6 6.1 6.5 4.9 5.2 7.2 7.7
5.3 6.0 6.2 7.1 7.3 6.9 7.3 6.5 5.8 5.8 5.2 10.5 4.8 5.9 5.3 5.4 5.9 5.8
5.1 5.0 5.3 5.8 4.9 5.4 7.2 6.2 6.0 5.9 4.4 5.6 6.2 5.8 5.3 5.4 5.3
4.6 6.6 5.0 7.7 5.4
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S

Figure 7b. AIRCRAFT 1000 - 301 hPa RMS O-B vector (ms-1). **DECEMBER 2002**
Observations with O-B vector difference greater than 60 ms-1 excluded
Values are printed where greater than 30 obs are present

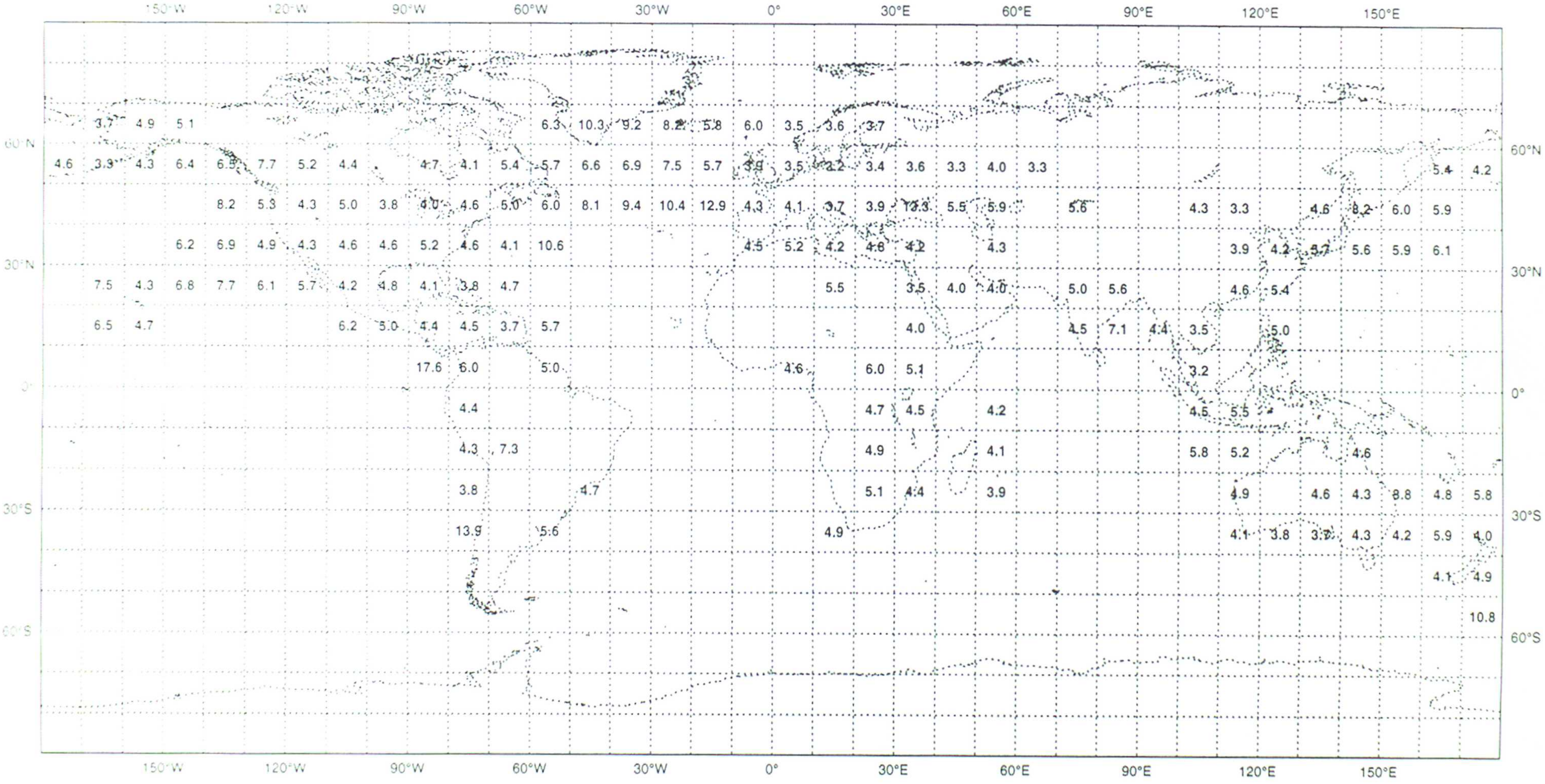

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
3.7 4.9 5.1 6.3 10.3 9.2 8.2 5.8 6.0 3.5 3.6 3.7
4.6 3.9 4.3 6.4 6.5 7.7 5.2 4.4 4.7 4.1 5.4 5.7 6.6 6.9 7.5 5.7 3.9 3.5 2.2 3.4 3.6 3.3 4.0 3.3 5.4 4.2
8.2 5.3 4.3 5.0 3.8 4.0 4.6 5.0 6.0 8.1 9.4 10.4 12.9 4.3 4.1 3.7 3.9 13.3 5.5 5.9 5.6 4.3 3.3 4.6 8.2 6.0 5.9
6.2 6.9 4.9 4.3 4.6 4.6 5.2 4.6 4.1 10.6 4.5 5.2 4.2 4.6 4.2 4.3 3.9 4.2 5.7 5.6 5.9 6.1
7.5 4.3 6.8 7.7 6.1 5.7 4.2 4.8 4.1 3.8 4.7 5.5 3.5 4.0 4.0 5.0 5.6 4.6 5.4
6.5 4.7 6.2 5.0 4.4 4.5 3.7 5.7 4.0 4.5 7.1 4.4 3.5 5.0
17.6 6.0 5.0 4.6 6.0 5.1 3.2
4.4 4.7 4.5 4.2 4.5 5.5
4.3 7.3 4.9 4.1 5.8 5.2 4.6
3.8 4.7 5.1 4.4 3.9 4.9 4.6 4.3 8.8 4.8 5.8
13.9 5.6 4.9 4.1 3.8 3.7 4.3 4.2 5.9 4.0
4.1 4.9
10.8

TABLE 5

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: December 2002

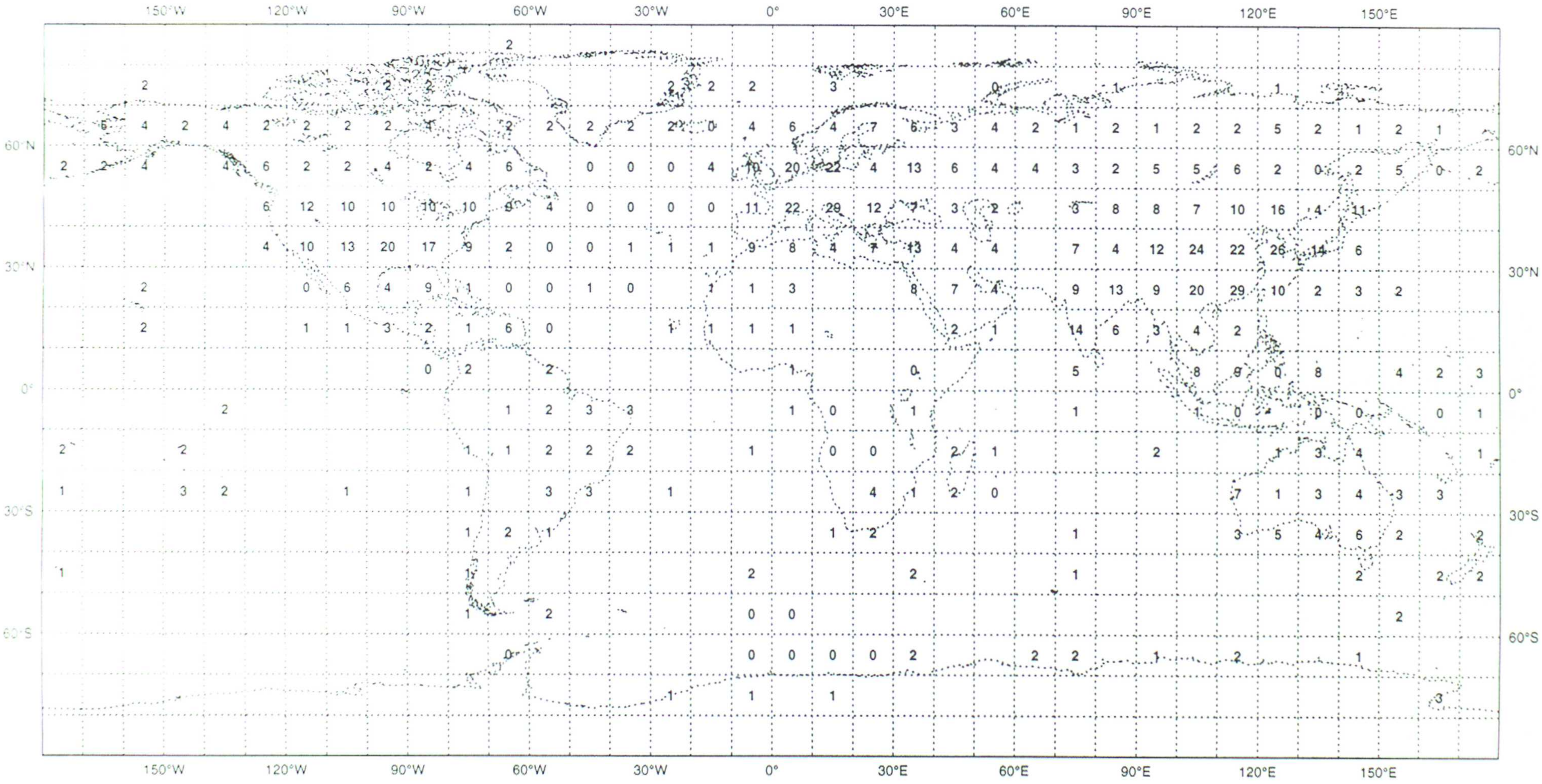
Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from each unique identifier for radiosonde TEMPs.
Area monitored		:90°N - 90°S, 180°W - 180°E.
Standard of comparison		:Background field from UKMO global model.
Observation times		:00 UTC and 12 UTC.
Level(s) monitored		:Standard levels between 1000.0 - 30.0 hPa
Element monitored		:GEOPOTENTIAL HEIGHT IN metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:% REJ	:Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
	:NUM LEVELS	:Number of levels satisfying selection criteria.
GROSS ERROR LIMITS	:Defined in Appendix I.1	
SELECTION CRITERIA	: ≥3 levels with ≥10 observations and ≥ 100 m weighted RMS.	

ONLY THE WORST LEVEL IS SHOWN WITH UNWEIGHTED RMS

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	SD	BIAS	RMS	NUM LEVELS
23418	00	Z	50	65/ 57	25	0	137.2	101.7	170.8	5
26477	12	Z	50	56/ 31	12	1	149.6	75.3	167.5	4
32098	00	Z	1000	49/ 143	27	3	31.5	-28.4	42.5	4
42101	00	Z	150	30/ 76	21	3	56.6	-128.7	140.6	9
42182	00	Z	1000	29/ 77	22	8	12.9	-81.0	82.1	7
42339	00	Z	1000	26/ 73	5	22	7.1	-84.8	85.1	6
42339	12	Z	1000	26/ 73	1	27	0.0	-96.0	96.0	6
42361	00	Z	1000	26/ 78	18	6	13.3	-74.9	76.1	6
42397	00	Z	150	27/ 88	11	0	125.0	-90.8	154.5	5
42410	12	Z	1000	26/ 92	6	20	10.7	-88.5	89.1	4
42492	12	Z	150	26/ 85	19	1	68.3	-75.1	101.5	5
42724	12	Z	200	24/ 91	18	0	60.7	-83.6	103.3	4
42867	00	Z	150	21/ 79	23	0	94.1	-64.3	114.0	5
42971	12	Z	150	20/ 86	19	0	106.3	-13.9	107.2	5
43003	00	Z	1000	19/ 73	29	0	13.7	-44.8	46.8	8
43014	00	Z	200	20/ 75	17	1	76.5	-99.8	125.8	5
43128	00	Z	150	17/ 78	24	1	100.3	-69.3	121.9	6
43128	12	Z	50	17/ 78	10	0	57.9	185.9	194.7	4
43185	12	Z	100	16/ 81	15	0	98.1	57.9	113.9	6
43192	00	Z	1000	15/ 74	13	14	8.0	-89.2	89.6	5
43279	00	Z	50	13/ 80	20	1	109.6	118.9	161.7	7
43285	00	Z	100	13/ 75	13	0	143.8	-66.7	158.5	4
43295	00	Z	150	13/ 78	20	0	85.7	-48.2	98.3	4
43311	00	Z	250	11/ 73	20	0	61.1	-94.5	112.5	6
43311	12	Z	200	11/ 73	16	2	93.3	-58.8	110.3	6
43333	00	Z	30	12/ 93	9	1	107.2	210.0	235.8	5
43346	00	Z	100	11/ 80	29	0	88.5	-87.3	124.3	6
43353	12	Z	1000	10/ 76	21	3	10.3	-82.1	82.8	5
43369	00	Z	200	8/ 73	16	0	106.5	23.1	109.0	6
43369	12	Z	250	8/ 73	21	1	65.3	99.8	119.3	6
61967	00	Z	1000	-7/ 72	16	0	8.7	87.0	87.4	9
61967	12	Z	1000	-7/ 72	12	0	4.9	88.8	88.9	7

Figure 8. TEMP 500 hPa geopotential mean daily count. **DECEMBER 2002**
All hours
Global average number of observations in 24 hours = **1125**


150°W
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120°E
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0°
30°S
60°S
2
2 2 2 2 2 2 2 3 0 1 1
6 4 2 4 2 2 2 2 4 2 2 2 2 2 0 4 6 4 7 6 3 4 2 1 2 1 2 2 5 2 1 2 1
2 2 4 4 6 2 2 4 2 4 6 0 0 0 4 10 20 22 4 13 6 4 4 3 2 5 5 6 2 0 2 5 0 2
6 12 10 10 10 10 9 4 0 0 0 0 11 22 29 12 7 3 2 3 8 8 7 10 16 4 11
4 10 13 20 17 9 2 0 0 1 1 1 9 8 4 7 13 4 4 7 4 12 24 22 26 14 6
2 0 6 4 9 1 0 0 1 0 1 1 3 8 7 4 9 13 9 20 29 10 2 3 2
2 1 1 3 2 1 6 0 1 1 1 1 2 1 14 6 3 4 2
0 2 2 0 5 8 8 0 8 4 2 3
2 1 2 3 3 1 0 1 1 1 0 0 0 1
2 2 1 1 2 2 2 1 0 0 2 1 2 1 3 4 1
1 3 2 1 1 3 3 1 4 1 2 0 7 1 3 4 3 3
1 2 1 1 2 1 3 5 4 6 2 2
1 1 2 2 1 2 2 2
1 2 0 0 2
0 0 0 0 0 2 2 2 1 2 1
1 1 1 3

TABLE 6

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: December 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 1000.0 - 100.0 hPa

Element monitored :VECTOR WIND in m s^{-1}

Parameters monitored

:NUM OBS :Number of observations available at level shown during period.

:NUM GROSS :Number of gross errors at level shown during period.

:% REJ :Percentage of observations rejected by quality control at level shown during period excluding those with gross errors.

:UBIAS,VBIAS :Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.

:RMS :Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

:NUM LEVELS :Number of levels satisfying selection criteria.

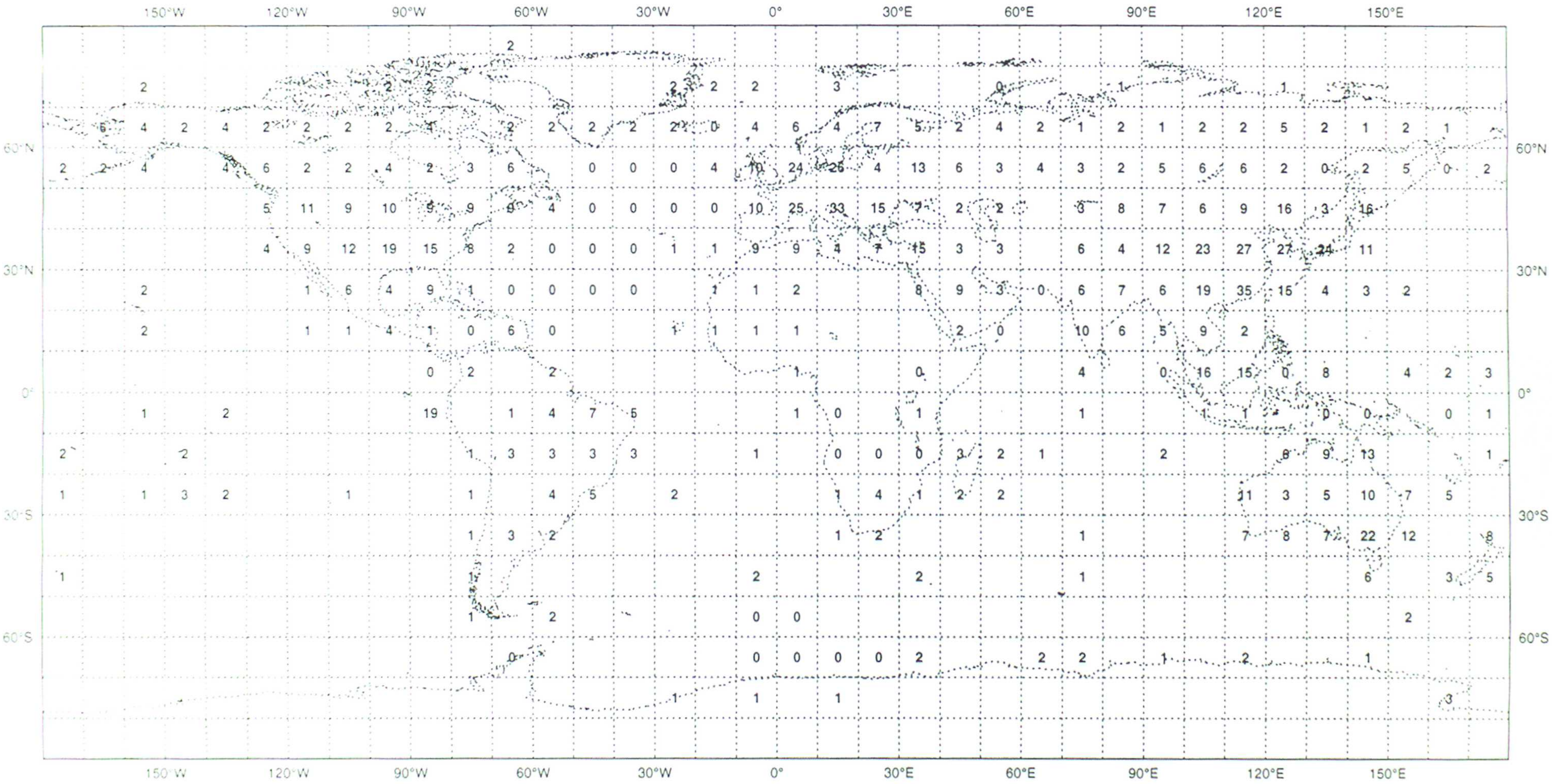
GROSS ERROR LIMITS :Defined in Appendix I.2

SELECTION CRITERIA : $\geq$ 10 observations and $\geq$ 15 m s^{-1} RMS vector wind.

ONLY THE STANDARD LEVEL BETWEEN 1000 - 100 hPa WITH HIGHEST RMS IS SHOWN

WMO IDENT	OBS TIME	ELM	LEV	LAT/LONG	NUM OBS	NUM GROSS	% REJ	UBIAS	VBIAS	RMS	LEVELS
PSPIU	00	V	150	-5/ -81	30	0	100	-2.6	0.1	25.6	3
PSPIU	12	V	100	-5/ -81	29	0	100	-9.1	3.1	27.4	2
04320	00	V	500	77/ -19	31	0	12	-4.7	0.2	15.1	1
04320	12	V	700	77/ -19	29	0	20	-6.2	0.1	18.0	1
07110	00	V	200	48/ -4	29	0	10	-4.1	-0.1	17.0	2
17351	00	V	150	37/ 35	28	0	100	-12.1	3.4	18.2	2
17351	12	V	250	37/ 35	29	0	100	-8.0	4.6	17.3	3
40375	12	V	200	28/ 37	10	0	10	-4.3	-2.4	16.1	1
40582	00	V	150	29/ 48	24	0	4	-4.6	2.2	24.1	2
40754	00	V	150	36/ 51	22	0	9	-6.6	0.2	21.5	1
41739	12	V	500	27/ 64	9	0	33	-5.3	-4.4	21.0	1
42182	00	V	250	29/ 77	19	1	100	-2.8	-1.1	27.4	1
42361	00	V	300	26/ 78	10	0	100	6.9	-3.7	15.9	1
42410	00	V	250	26/ 92	15	0	100	-3.8	10.9	18.5	2
42410	12	V	300	26/ 92	12	0	100	3.7	10.6	19.4	2
42647	12	V	200	23/ 73	12	1	75	13.6	5.2	18.4	3
42874	12	V	300	21/ 82	17	0	23	0.3	0.7	16.1	1
48455	00	V	200	14/ 101	28	0	96	-9.6	-1.6	21.7	4
56146	00	V	150	32/ 100	10	0	100	4.9	4.9	15.0	1
56146	12	V	150	32/ 100	12	0	100	7.2	5.3	16.7	1
56964	00	V	150	23/ 101	31	0	9	-0.8	-1.9	18.9	1
60360	12	V	200	37/ 8	12	0	100	11.7	-6.2	22.5	2
60620	12	V	250	28/ 0	13	0	100	-7.2	3.6	19.5	2
62337	00	V	200	31/ 34	24	0	100	-12.0	11.1	24.4	4
62337	12	V	200	31/ 34	24	0	100	-9.9	15.0	21.2	4
62378	00	V	250	30/ 31	28	0	100	-7.4	0.2	20.2	4
62378	12	V	200	30/ 31	23	0	100	-17.5	-2.0	23.8	4
68512	12	V	200	-30/ 18	20	0	100	-14.5	-3.6	18.4	2
72376	12	V	250	35/-112	25	0	12	3.5	-3.6	18.6	2

Figure 9. TEMP/PILOT 300 hPa wind mean daily count. DECEMBER 2002
All hours
Global average number of observations in 24 hours = 1298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120°W
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90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2
2 2 2 2 3 0 1 1
6 4 2 4 2 2 2 2 2 2 2 2 2 0 4 6 4 7 5 2 4 2 1 2 1 2 2 5 2 1 2 1
2 2 4 4 6 2 2 4 2 3 6 0 0 0 4 10 24 26 4 13 6 3 4 3 2 5 6 6 2 0 2 5 0 2
5 11 9 10 5 9 9 4 0 0 0 0 10 25 33 15 7 2 2 3 8 7 6 9 16 3 16
4 9 12 19 15 8 2 0 0 0 1 1 9 9 4 7 15 3 3 6 4 12 23 27 27 24 11
2 1 6 4 9 1 0 0 0 0 1 1 2 8 9 3 0 6 7 6 19 35 15 4 3 2
2 1 1 4 1 0 6 0 1 1 1 1 2 0 10 6 5 9 2
0 2 2 1 0 4 0 16 15 0 8 4 2 3
1 2 19 1 4 7 5 1 0 1 1 1 1 0 0 0 1
2 2 1 3 3 3 3 1 0 0 0 3 2 1 2 8 9 13 1
1 1 3 2 1 1 4 5 2 1 4 1 2 2 11 3 5 10 7 5
1 3 2 1 2 1 7 8 7 22 12 8
1 1 2 2 1 6 3 5
1 2 0 0 2
0 0 0 0 0 2 2 2 1 2 1
1 1 1 3

TABLE 7

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS
MONITORING CENTRE: BRACKNELL
MONTH: December 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for radiosonde TEMPs.

Area monitored :90°N - 90°S, 180°W - 180°E.

Standard of comparison :Background field from UKMO global model.

Observation times :00 UTC and 12 UTC.

Level(s) monitored :Standard levels between 500.0 - 150.0 hPa

Element monitored :WIND DIRECTION in degrees

Parameters monitored

:NUM OBS :Average number of observations at all levels.

:BIAS :Mean difference of observations from background values from all levels.

:MAX SPREAD :(For observation - background values) Maximum absolute difference of SD at any level from SD at all levels

:SD :SD of difference of observations from background values at all levels.

SELECTION CRITERIA :NUM OBS ≥ 5, and
ABSOLUTE BIAS ≥ 10°, with
SD < 30°, and
MAX SPREAD < 10°

WMO IDENT	OBS TIME	ELM	LAT/LONG	NUM OBS	BIAS	MAX SPREAD	SD
10468	00	DD	52/ 12	22	11.5	2.7	11.0
10468	12	DD	52/ 12	22	14.4	8.3	15.0
17062	12	DD	41/ 29	26	10.1	1.7	19.9
17280	12	DD	38/ 40	27	-11.3	5.6	10.0
29612	12	DD	55/ 78	25	22.8	1.8	6.6
60559	12	DD	33/ 7	6	-15.3	8.6	10.8
62337	12	DD	31/ 34	24	-20.5	8.1	9.5
82965	00	DD	-10/ -56	6	-15.0	8.7	25.7

MONITORING OF SATELLITE WINDS

MONITORING CENTRE: BRACKNELL

MONTH: December 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from GOES-8, GOES-10, METEOSAT-5, METEOSAT-7, GMS-5, INSAT.

Standard of comparison :Background field from UKMO global model.

Selection Criteria :number of observations > 10.

Data Extracted :Layer 701 - 1000 hPa
401 - 700 hPa
101 - 400 hPa

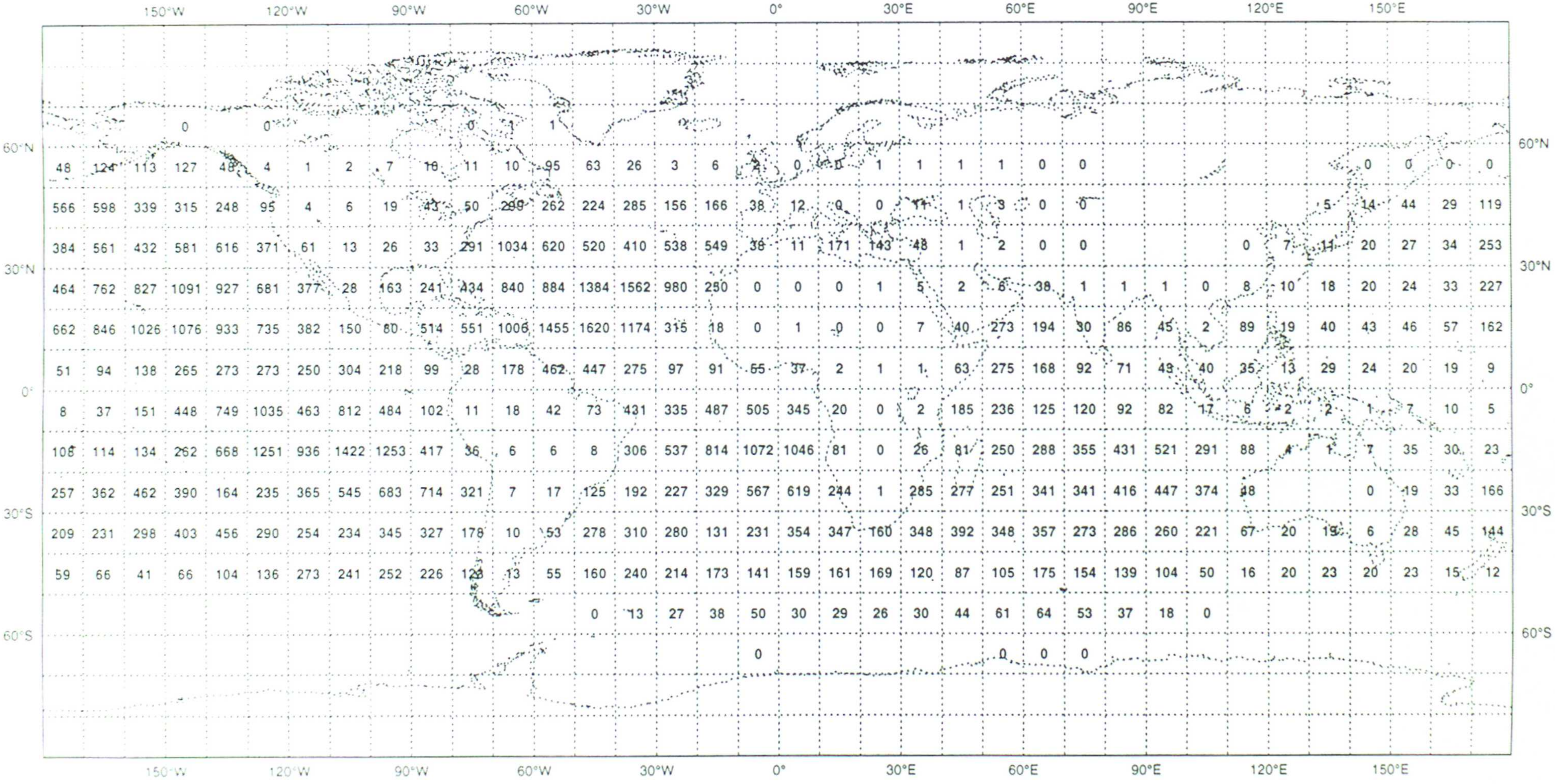
:Mean wind

:Mean observation minus background vector wind differences

:Mean observation minus background speed differences

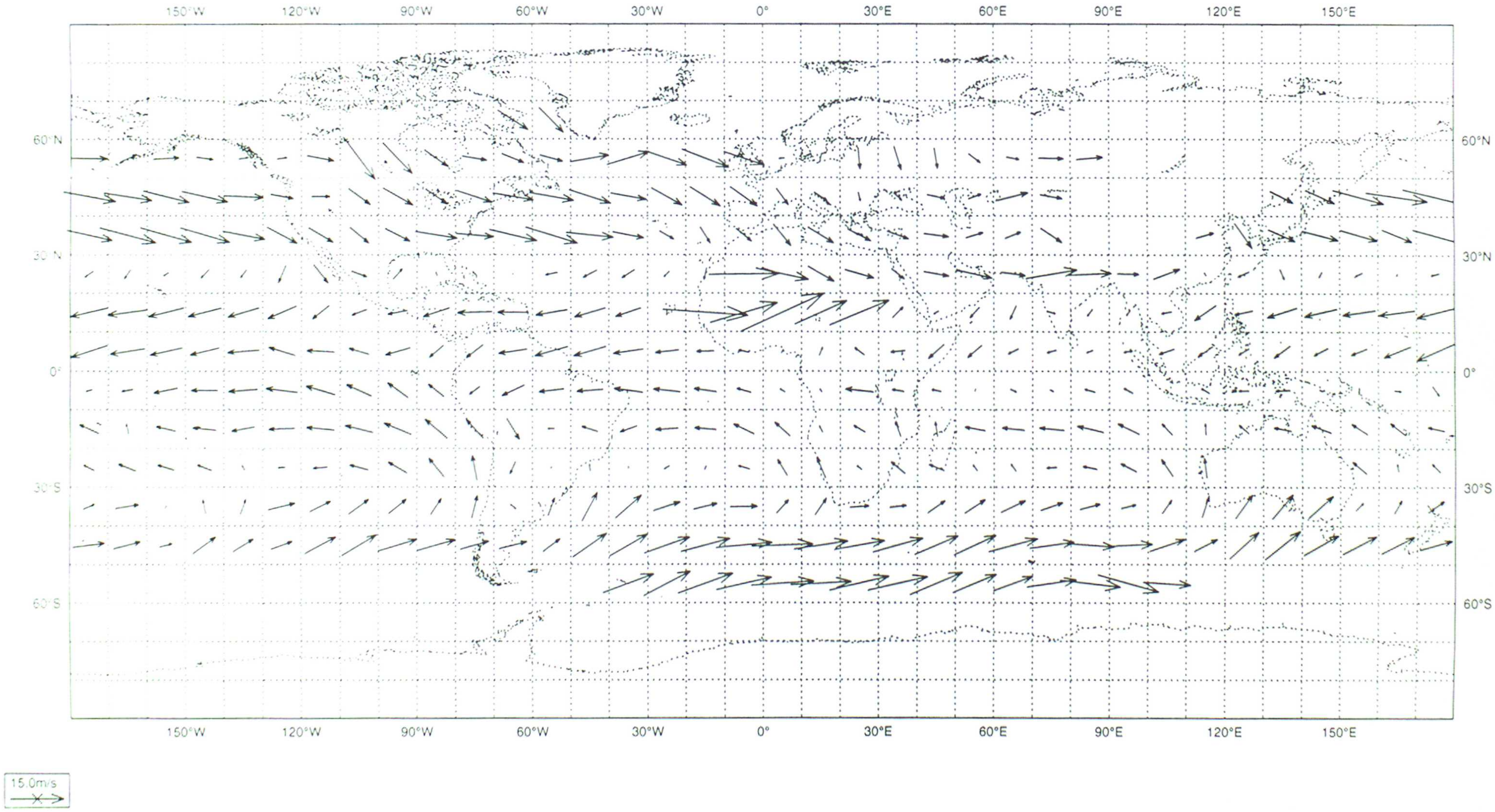
:RMS of observation minus background vector differences

Figure 10. SATOB 701 - 1000 hPa mean daily count. DECEMBER 2002
Global average number of observations in 24 hours = 86004



			0		0					0	1	1																							
48	124	113	127	48	4	1	2	7	10	11	10	95	63	26	3	6	2	0	0	1	1	1	1	0	0							0	0	0	0
566	598	339	315	248	95	4	6	19	43	50	290	262	224	285	156	166	38	12	0	0	11	1	3	0	0						5	14	44	29	119
384	561	432	581	616	371	61	13	26	33	291	1034	620	520	410	538	549	38	11	171	143	48	1	2	0	0				0	7	11	20	27	34	253
464	762	827	1091	927	681	377	28	163	241	434	840	884	1384	1562	980	250	0	0	0	1	5	2	6	38	1	1	1	0	8	10	18	20	24	33	227
662	846	1026	1076	933	735	382	150	80	514	551	1006	1455	1620	1174	315	18	0	1	0	0	7	40	273	194	30	86	45	2	89	19	40	43	46	57	162
51	94	138	265	273	273	250	304	218	99	28	178	462	447	275	97	91	55	37	2	1	1	63	275	168	92	71	43	40	35	13	29	24	20	19	9
8	37	151	448	749	1035	463	812	484	102	11	18	42	73	431	335	487	505	345	20	0	2	185	236	125	120	92	82	17	6	2	2	1	7	10	5
108	114	134	262	668	1251	936	1422	1253	417	36	6	6	8	306	537	814	1072	1046	81	0	26	81	250	288	355	431	521	291	88	4	1	7	35	30	23
257	362	462	390	164	235	365	545	683	714	321	7	17	125	192	227	329	567	619	244	1	285	277	251	341	341	416	447	374	48			0	19	33	166
209	231	298	403	456	290	254	234	345	327	178	10	53	278	310	280	131	231	354	347	160	348	392	348	357	273	286	260	221	67	20	19	6	28	45	144
59	66	41	66	104	136	273	241	252	226	123	13	55	160	240	214	173	141	159	161	169	120	87	105	175	154	139	104	50	16	20	23	20	23	15	12
													0	13	27	38	50	30	29	26	30	44	61	64	53	37	18	0							
																	0						0	0	0										

Figure 11. SATOB 701 - 1000 hPa vector mean wind. **DECEMBER 2002**
All observations
Arrows are plotted where greater than 10 obs are present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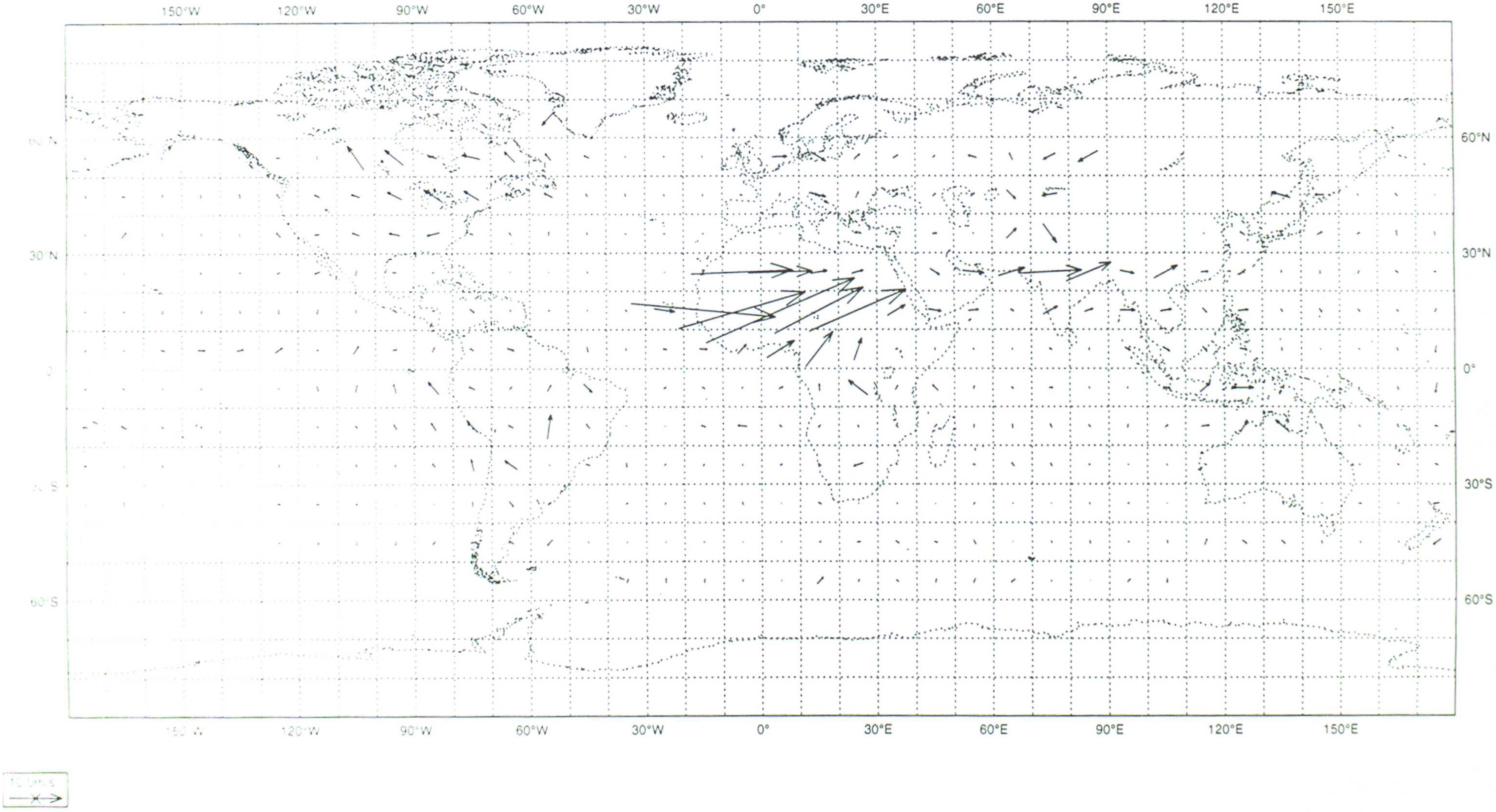
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 12. SATOB 701 - 1000 hPa mean vector wind differences. **DECEMBER 2002**
All observations
Arrows are plotted where greater than 10 obs are present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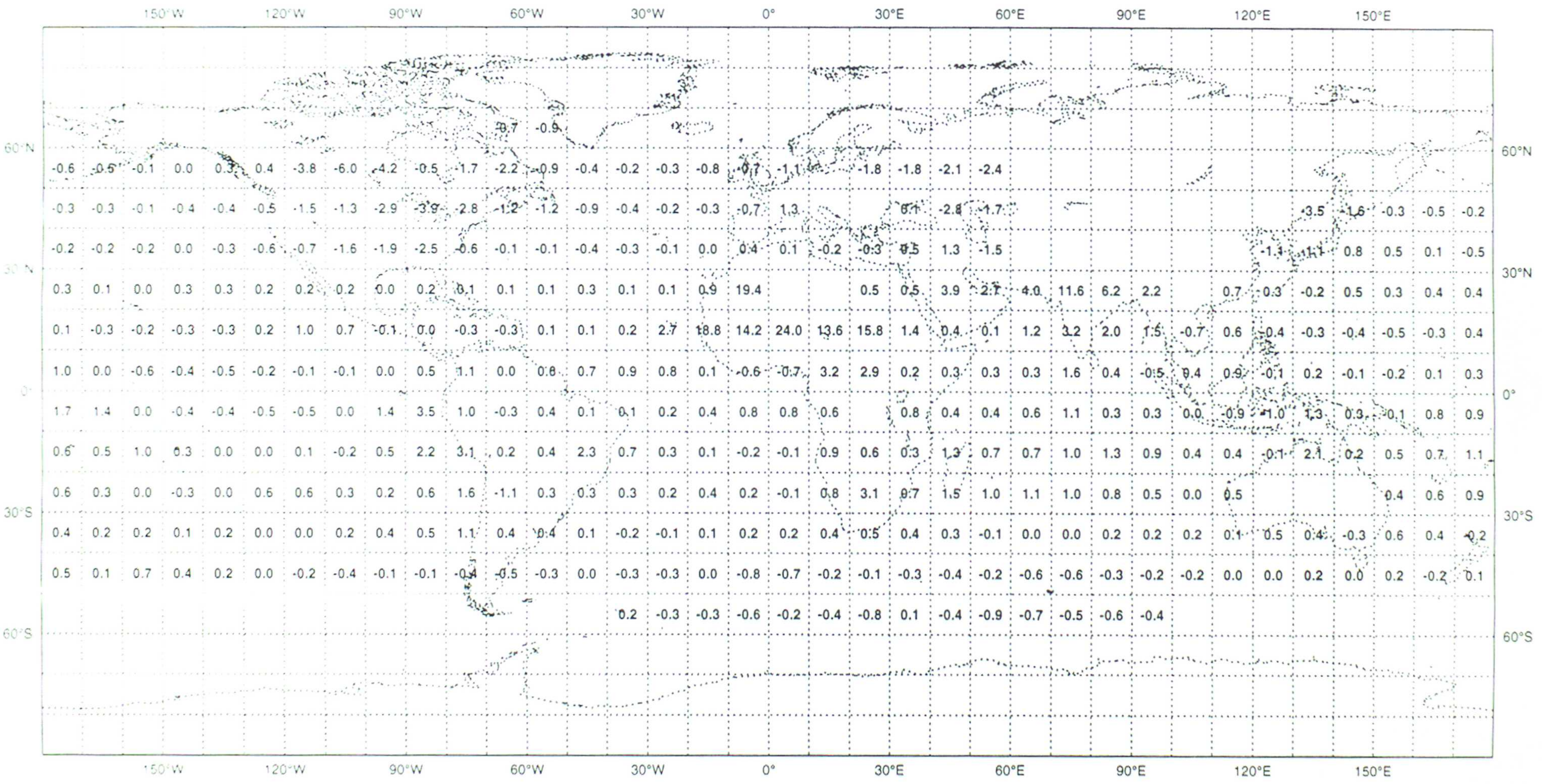
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 13. SATOB 701 - 1000 hPa mean O-B speed differences (ms-1). DECEMBER 2002
All observations
Values are plotted where greater than 10 obs are present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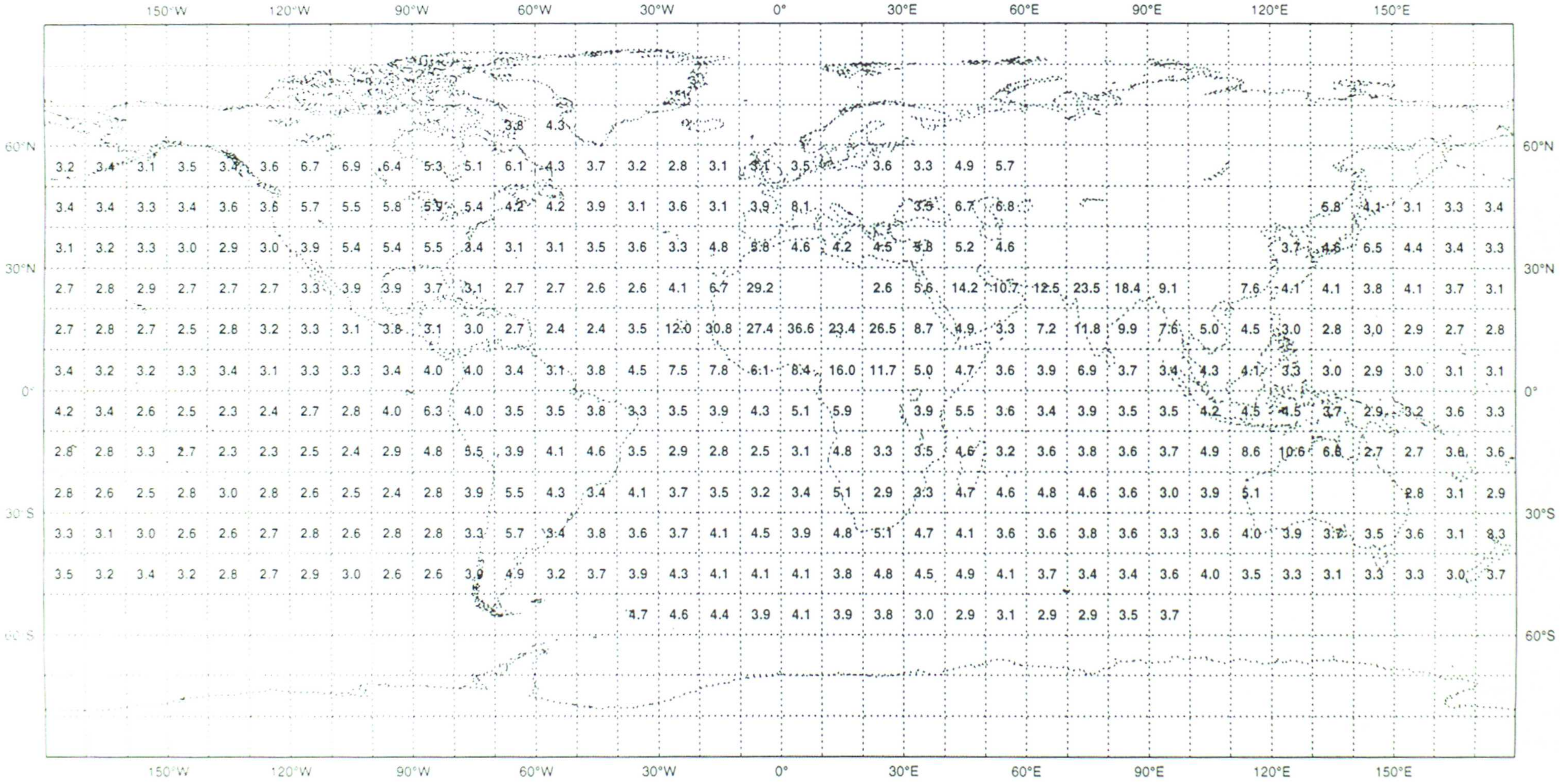
60°N 30°N 0° 30°S 60°S
-0.7 -0.9
-0.6 -0.5 -0.1 0.0 0.3 0.4 -3.8 -6.0 -4.2 -0.5 -1.7 -2.2 -0.9 -0.4 -0.2 -0.3 -0.8 -0.7 -1.1 -1.8 -1.8 -2.1 -2.4
-0.3 -0.3 -0.1 -0.4 -0.4 -0.5 -1.5 -1.3 -2.9 -3.9 -2.8 -1.2 -1.2 -0.9 -0.4 -0.2 -0.3 -0.7 1.3 0.1 -2.8 -1.7 -3.5 -1.6 -0.3 -0.5 -0.2
-0.2 -0.2 -0.2 0.0 -0.3 -0.6 -0.7 -1.6 -1.9 -2.5 -0.6 -0.1 -0.1 -0.4 -0.3 -0.1 0.0 0.4 0.1 -0.2 -0.3 0.5 1.3 -1.5 -1.1 1.1 0.8 0.5 0.1 -0.5
0.3 0.1 0.0 0.3 0.3 0.2 0.2 0.2 0.0 0.2 0.1 0.1 0.1 0.3 0.1 0.1 0.9 19.4 0.5 0.5 3.9 2.7 4.0 11.6 6.2 2.2 0.7 0.3 -0.2 0.5 0.3 0.4 0.4
0.1 -0.3 -0.2 -0.3 -0.3 0.2 1.0 0.7 -0.1 0.0 -0.3 -0.3 0.1 0.1 0.2 2.7 18.8 14.2 24.0 13.6 15.8 1.4 0.4 0.1 1.2 3.2 2.0 1.5 -0.7 0.6 -0.4 -0.3 -0.4 -0.5 -0.3 0.4
1.0 0.0 -0.6 -0.4 -0.5 -0.2 -0.1 -0.1 0.0 0.5 1.1 0.0 0.8 0.7 0.9 0.8 0.1 -0.6 -0.7 3.2 2.9 0.2 0.3 0.3 0.3 1.6 0.4 -0.5 0.4 0.9 -0.1 0.2 -0.1 -0.2 0.1 0.3
1.7 1.4 0.0 -0.4 -0.4 -0.5 -0.5 0.0 1.4 3.5 1.0 -0.3 0.4 0.1 0.1 0.2 0.4 0.8 0.8 0.6 0.8 0.4 0.4 0.6 1.1 0.3 0.3 0.0 -0.9 -1.0 1.3 0.3 -0.1 0.8 0.9
0.6 0.5 1.0 0.3 0.0 0.0 0.1 -0.2 0.5 2.2 3.1 0.2 0.4 2.3 0.7 0.3 0.1 -0.2 -0.1 0.9 0.6 0.3 1.3 0.7 0.7 1.0 1.3 0.9 0.4 0.4 -0.1 2.1 0.2 0.5 0.7 1.1
0.6 0.3 0.0 -0.3 0.0 0.6 0.6 0.3 0.2 0.6 1.6 -1.1 0.3 0.3 0.3 0.2 0.4 0.2 -0.1 0.8 3.1 0.7 1.5 1.0 1.1 1.0 0.8 0.5 0.0 0.5 0.4 0.6 0.9
0.4 0.2 0.2 0.1 0.2 0.0 0.0 0.2 0.4 0.5 1.1 0.4 0.4 0.1 -0.2 -0.1 0.1 0.2 0.2 0.4 0.5 0.4 0.3 -0.1 0.0 0.0 0.2 0.2 0.2 0.1 0.5 0.4 -0.3 0.6 0.4 -0.2
0.5 0.1 0.7 0.4 0.2 0.0 -0.2 -0.4 -0.1 -0.1 -0.4 -0.5 -0.3 0.0 -0.3 -0.3 0.0 -0.8 -0.7 -0.2 -0.1 -0.3 -0.4 -0.2 -0.6 -0.6 -0.3 -0.2 -0.2 0.0 0.0 0.2 0.0 0.2 -0.2 0.1
0.2 -0.3 -0.3 -0.6 -0.2 -0.4 -0.8 0.1 -0.4 -0.9 -0.7 -0.5 -0.6 -0.4

Figure 14. SATOB 701 - 1000 hPa mean RMS O-B vector differences (ms-1). DECEMBER 2002
All observations
Values are plotted where greater than 10 obs are present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60°N
30°N
0°
30°S
60°S
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3.2 3.4 3.1 3.5 3.4 3.6 6.7 6.9 6.4 5.3 5.1 6.1 4.3 3.7 3.2 2.8 3.1 3.1 3.5 3.6 3.3 4.9 5.7
3.4 3.4 3.3 3.4 3.6 3.6 5.7 5.5 5.8 5.9 5.4 4.2 4.2 3.9 3.1 3.6 3.1 3.9 8.1 3.5 6.7 6.8 5.8 4.1 3.1 3.3 3.4
3.1 3.2 3.3 3.0 2.9 3.0 3.9 5.4 5.4 5.5 3.4 3.1 3.1 3.5 3.6 3.3 4.8 3.8 4.6 4.2 4.5 3.8 5.2 4.6 3.7 4.6 6.5 4.4 3.4 3.3
2.7 2.8 2.9 2.7 2.7 2.7 3.3 3.9 3.9 3.7 3.1 2.7 2.7 2.6 2.6 4.1 6.7 29.2 2.6 5.6 14.2 10.7 12.5 23.5 18.4 9.1 7.6 4.1 4.1 3.8 4.1 3.7 3.1
2.7 2.8 2.7 2.5 2.8 3.2 3.3 3.1 3.8 3.1 3.0 2.7 2.4 2.4 3.5 12.0 30.8 27.4 36.6 23.4 26.5 8.7 4.9 3.3 7.2 11.8 9.9 7.6 5.0 4.5 3.0 2.8 3.0 2.9 2.7 2.8
3.4 3.2 3.2 3.3 3.4 3.1 3.3 3.3 3.4 4.0 4.0 3.4 3.1 3.8 4.5 7.5 7.8 6.1 8.4 16.0 11.7 5.0 4.7 3.6 3.9 6.9 3.7 3.4 4.3 4.1 3.3 3.0 2.9 3.0 3.1 3.1
4.2 3.4 2.6 2.5 2.3 2.4 2.7 2.8 4.0 6.3 4.0 3.5 3.5 3.8 3.3 3.5 3.9 4.3 5.1 5.9 3.9 5.5 3.6 3.4 3.9 3.5 3.5 4.2 4.5 4.5 3.7 2.9 3.2 3.6 3.3
2.8 2.8 3.3 2.7 2.3 2.3 2.5 2.4 2.9 4.8 5.5 3.9 4.1 4.6 3.5 2.9 2.8 2.5 3.1 4.8 3.3 3.5 4.6 3.2 3.6 3.8 3.6 3.7 4.9 8.6 10.6 6.8 2.7 2.7 3.8 3.6
2.8 2.6 2.5 2.8 3.0 2.8 2.6 2.5 2.4 2.8 3.9 5.5 4.3 3.4 4.1 3.7 3.5 3.2 3.4 5.1 2.9 3.3 4.7 4.6 4.8 4.6 3.6 3.0 3.9 5.1 2.8 3.1 2.9
3.3 3.1 3.0 2.6 2.6 2.7 2.8 2.6 2.8 2.8 3.3 5.7 3.4 3.8 3.6 3.7 4.1 4.5 3.9 4.8 5.1 4.7 4.1 3.6 3.6 3.8 3.6 3.3 3.6 4.0 3.9 3.7 3.5 3.6 3.1 3.3
3.5 3.2 3.4 3.2 2.8 2.7 2.9 3.0 2.6 2.6 3.9 4.9 3.2 3.7 3.9 4.3 4.1 4.1 4.1 3.8 4.8 4.5 4.9 4.1 3.7 3.4 3.4 3.6 4.0 3.5 3.3 3.1 3.3 3.3 3.0 3.7
4.7 4.6 4.4 3.9 4.1 3.9 3.8 3.0 2.9 3.1 2.9 2.9 3.5 3.7

Figure 15. SATOB 401 - 700 hPa mean daily count. DECEMBER 2002
Global average number of observations in 24 hours = 20034

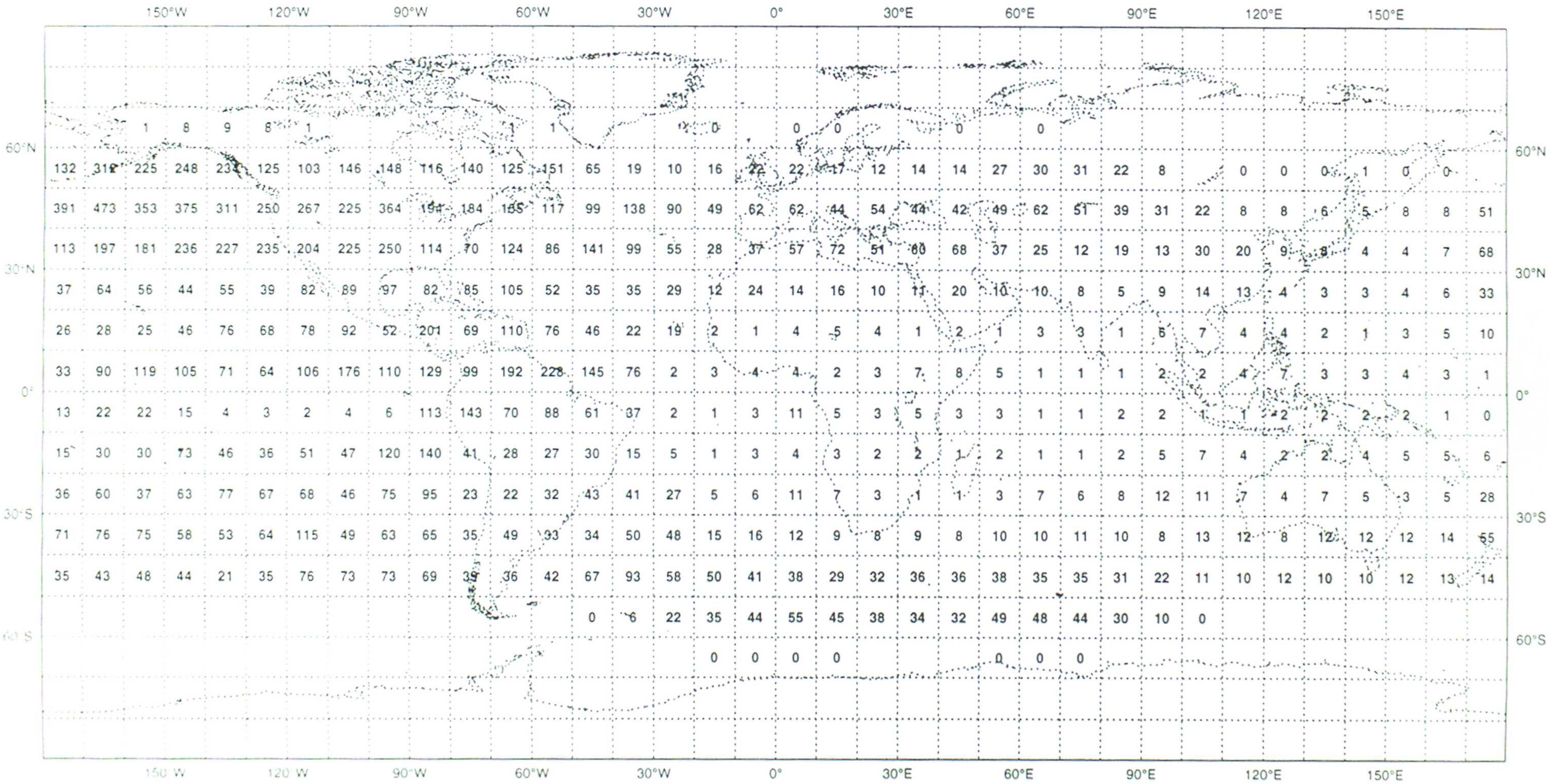

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
1 8 9 8 1 1 1 0 0 0 0 0
132 318 225 248 234 125 103 146 148 116 140 125 151 65 19 10 16 22 22 17 12 14 14 27 30 31 22 8 0 0 0 1 0 0
391 473 353 375 311 250 267 225 364 194 184 155 117 99 138 90 49 62 62 44 54 44 42 49 62 51 39 31 22 8 8 6 5 8 8 51
113 197 181 236 227 235 204 225 250 114 70 124 86 141 99 55 28 37 57 72 51 80 68 37 25 12 19 13 30 20 9 8 4 4 7 68
37 64 56 44 55 39 82 89 97 82 85 105 52 35 35 29 12 24 14 16 10 11 20 10 10 8 5 9 14 13 4 3 3 4 6 33
26 28 25 46 76 68 78 92 52 201 69 110 76 46 22 19 2 1 4 5 4 1 2 1 3 3 1 5 7 4 4 2 1 3 5 10
33 90 119 105 71 64 106 176 110 129 99 192 228 145 76 2 3 4 4 2 3 7 8 5 1 1 1 2 2 4 7 3 3 4 3 1
13 22 22 15 4 3 2 4 6 113 143 70 88 61 37 2 1 3 11 5 3 5 3 3 1 1 2 2 1 1 2 2 2 2 1 0
15 30 30 73 46 36 51 47 120 140 41 28 27 30 15 5 1 3 4 3 2 2 1 2 1 1 2 5 7 4 2 2 4 5 5 6
36 60 37 63 77 67 68 46 75 95 23 22 32 43 41 27 5 6 11 7 3 1 1 3 7 6 8 12 11 7 4 7 5 3 5 28
71 76 75 58 53 64 115 49 63 65 35 49 33 34 50 48 15 16 12 9 8 9 8 10 10 11 10 8 13 12 8 12 12 12 14 55
35 43 48 44 21 35 76 73 73 69 39 36 42 67 93 58 50 41 38 29 32 36 36 38 35 35 31 22 11 10 12 10 10 12 13 14
0 6 22 35 44 55 45 38 34 32 49 48 44 30 10 0
0 0 0 0 0 0 0

Figure 16. SATOB 401 - 700 hPa vector mean wind. DECEMBER 2002
All observations
Arrows are plotted where greater than 10 obs are present

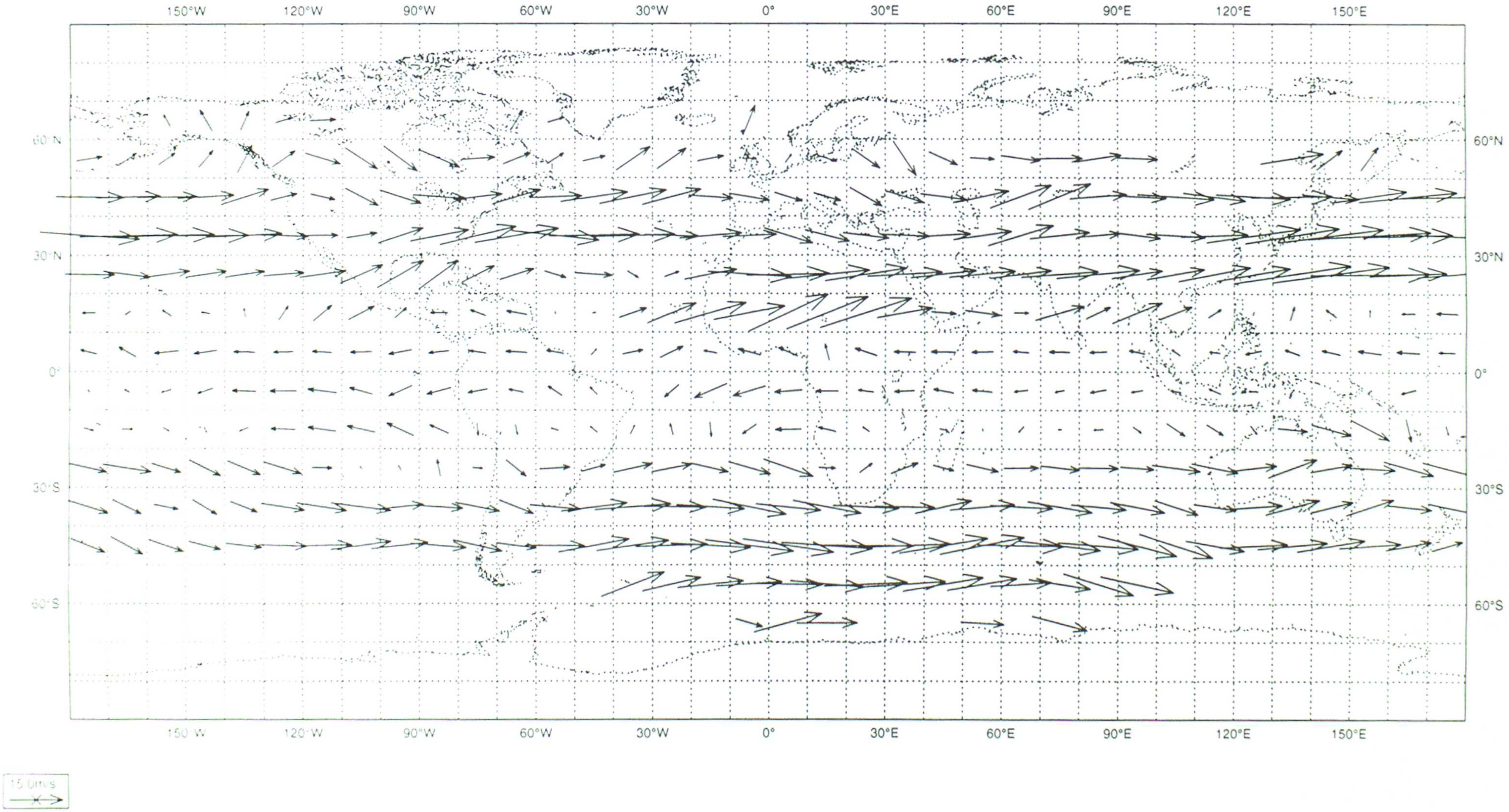

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15 m/s

Figure 17. SATOB 401 - 700 hPa mean vector wind differences. DECEMBER 2002
All observations
Arrows are plotted where greater than 10 obs are present

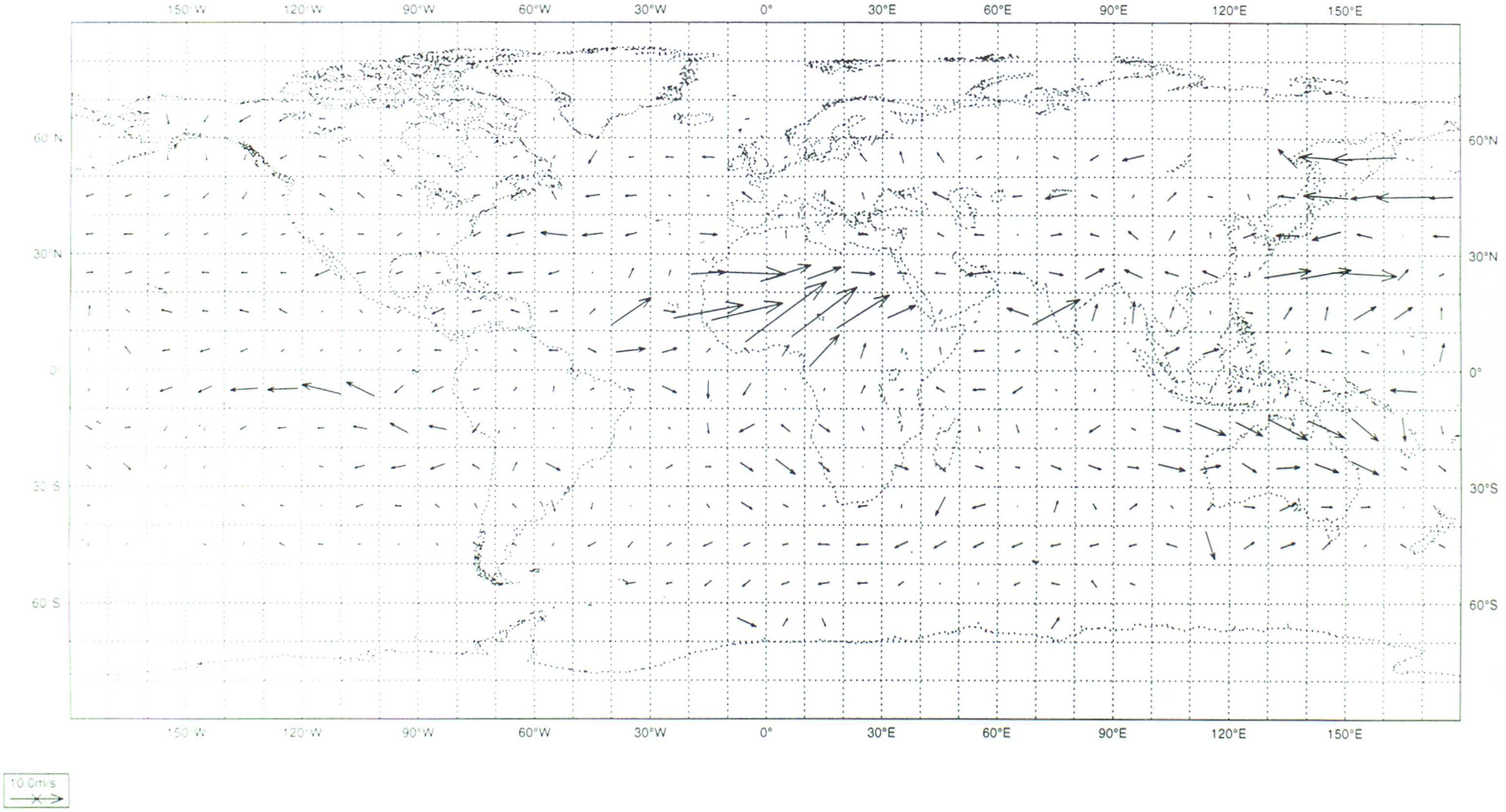

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 18. SATOB 401 - 700 hPa mean O-B speed differences (ms-1). DECEMBER 2002
All observations
Values are plotted where greater than 10 obs are present

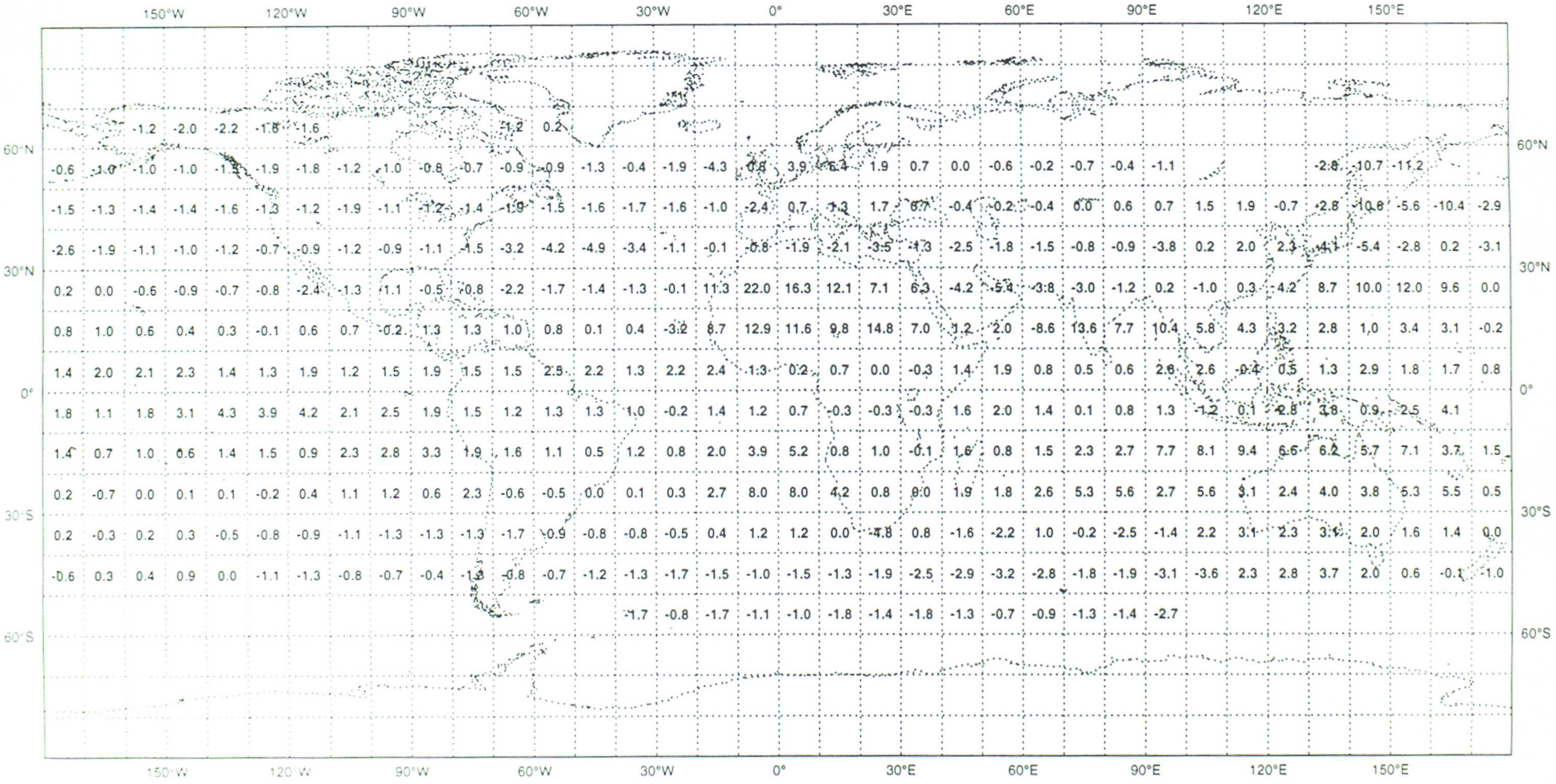

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-1.2 -2.0 -2.2 -1.8 -1.6 -1.2 0.2
-0.6 -1.0 -1.0 -1.0 -1.3 -1.9 -1.8 -1.2 -1.0 -0.8 -0.7 -0.9 -0.9 -1.3 -0.4 -1.9 -4.3 0.8 3.9 6.4 1.9 0.7 0.0 -0.6 -0.2 -0.7 -0.4 -1.1 -2.8 -10.7 -11.2
-1.5 -1.3 -1.4 -1.4 -1.6 -1.3 -1.2 -1.9 -1.1 -1.2 -1.4 -1.9 -1.5 -1.6 -1.7 -1.6 -1.0 -2.4 0.7 1.3 1.7 0.7 -0.4 -0.2 -0.4 0.0 0.6 0.7 1.5 1.9 -0.7 -2.8 -10.8 -5.6 -10.4 -2.9
-2.6 -1.9 -1.1 -1.0 -1.2 -0.7 -0.9 -1.2 -0.9 -1.1 -1.5 -3.2 -4.2 -4.9 -3.4 -1.1 -0.1 -0.8 -1.9 -2.1 -3.5 -1.3 -2.5 -1.8 -1.5 -0.8 -0.9 -3.8 0.2 2.0 2.3 -4.1 -5.4 -2.8 0.2 -3.1
0.2 0.0 -0.6 -0.9 -0.7 -0.8 -2.4 -1.3 -1.1 -0.5 -0.8 -2.2 -1.7 -1.4 -1.3 -0.1 11.3 22.0 16.3 12.1 7.1 6.3 -4.2 -5.4 -3.8 -3.0 -1.2 0.2 -1.0 0.3 4.2 8.7 10.0 12.0 9.6 0.0
0.8 1.0 0.6 0.4 0.3 -0.1 0.6 0.7 -0.2 1.3 1.3 1.0 0.8 0.1 0.4 -3.2 8.7 12.9 11.6 9.8 14.8 7.0 1.2 2.0 -8.6 13.6 7.7 10.4 5.8 4.3 3.2 2.8 1.0 3.4 3.1 -0.2
1.4 2.0 2.1 2.3 1.4 1.3 1.9 1.2 1.5 1.9 1.5 1.5 2.5 2.2 1.3 2.2 2.4 -1.3 0.2 0.7 0.0 -0.3 1.4 1.9 0.8 0.5 0.6 2.6 2.6 -0.4 0.5 1.3 2.9 1.8 1.7 0.8
1.8 1.1 1.8 3.1 4.3 3.9 4.2 2.1 2.5 1.9 1.5 1.2 1.3 1.3 1.0 -0.2 1.4 1.2 0.7 -0.3 -0.3 -0.3 1.6 2.0 1.4 0.1 0.8 1.3 -1.2 0.1 2.8 3.8 0.9 2.5 4.1
1.4 0.7 1.0 0.6 1.4 1.5 0.9 2.3 2.8 3.3 1.9 1.6 1.1 0.5 1.2 0.8 2.0 3.9 5.2 0.8 1.0 -0.1 1.6 0.8 1.5 2.3 2.7 7.7 8.1 9.4 6.6 6.2 5.7 7.1 3.7 1.5
0.2 -0.7 0.0 0.1 0.1 -0.2 0.4 1.1 1.2 0.6 2.3 -0.6 -0.5 0.0 0.1 0.3 2.7 8.0 8.0 4.2 0.8 0.0 1.9 1.8 2.6 5.3 5.6 2.7 5.6 3.1 2.4 4.0 3.8 5.3 5.5 0.5
0.2 -0.3 0.2 0.3 -0.5 -0.8 -0.9 -1.1 -1.3 -1.3 -1.3 -1.7 -0.9 -0.8 -0.8 -0.5 0.4 1.2 1.2 0.0 -4.8 0.8 -1.6 -2.2 1.0 -0.2 -2.5 -1.4 2.2 3.1 2.3 3.1 2.0 1.6 1.4 0.0
-0.6 0.3 0.4 0.9 0.0 -1.1 -1.3 -0.8 -0.7 -0.4 -1.3 -0.8 -0.7 -1.2 -1.3 -1.7 -1.5 -1.0 -1.5 -1.3 -1.9 -2.5 -2.9 -3.2 -2.8 -1.8 -1.9 -3.1 -3.6 2.3 2.8 3.7 2.0 0.6 -0.1 -1.0
-1.7 -0.8 -1.7 -1.1 -1.0 -1.8 -1.4 -1.8 -1.3 -0.7 -0.9 -1.3 -1.4 -2.7

Figure 19. SATOB 401 - 700 hPa mean RMS O-B vector differences (ms-1). DECEMBER 2002
All observations
Values are plotted where greater than 10 obs are present

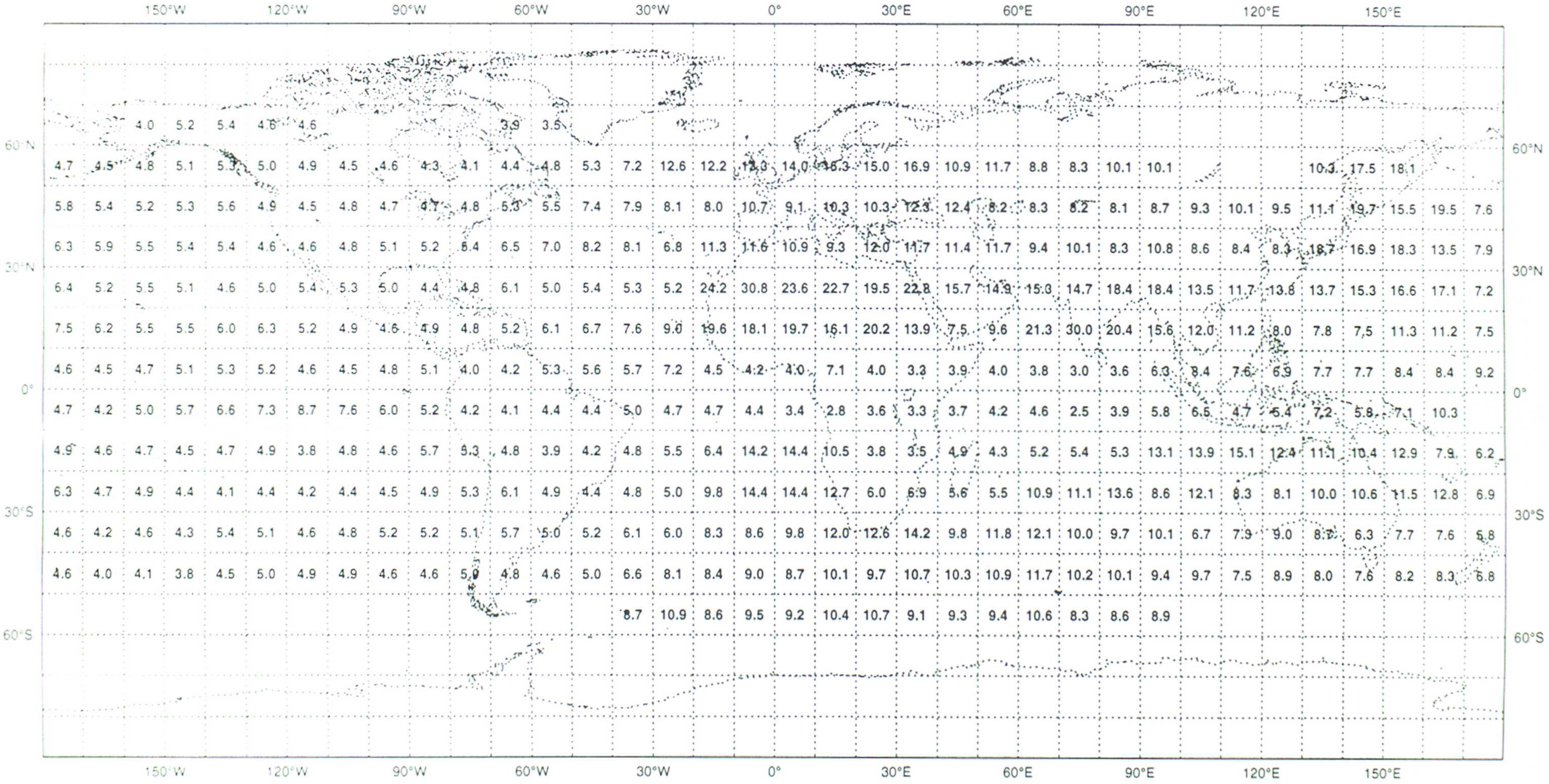
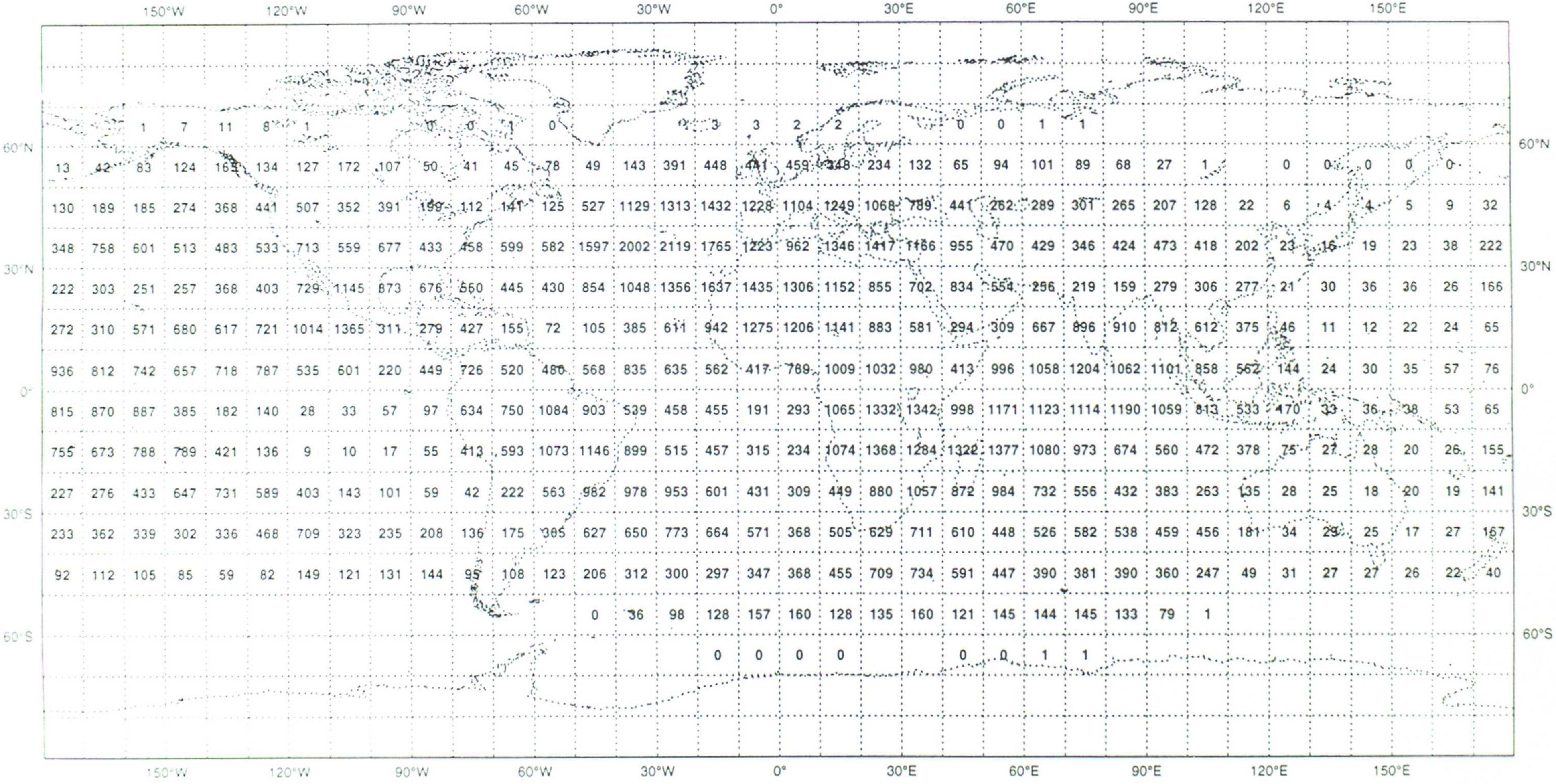

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
4.0 5.2 5.4 4.6 4.6 3.9 3.5
4.7 4.5 4.8 5.1 5.3 5.0 4.9 4.5 4.6 4.3 4.1 4.4 4.8 5.3 7.2 12.6 12.2 12.3 14.0 16.3 15.0 16.9 10.9 11.7 8.8 8.3 10.1 10.1 10.3 17.5 18.1
5.8 5.4 5.2 5.3 5.6 4.9 4.5 4.8 4.7 4.7 4.8 5.3 5.5 7.4 7.9 8.1 8.0 10.7 9.1 10.3 10.3 12.3 12.4 8.2 8.3 8.2 8.1 8.7 9.3 10.1 9.5 11.1 19.7 15.5 19.5 7.6
6.3 5.9 5.5 5.4 5.4 4.6 4.6 4.8 5.1 5.2 5.4 6.5 7.0 8.2 8.1 6.8 11.3 11.6 10.9 9.3 12.0 11.7 11.4 11.7 9.4 10.1 8.3 10.8 8.6 8.4 8.3 18.7 16.9 18.3 13.5 7.9
6.4 5.2 5.5 5.1 4.6 5.0 5.4 5.3 5.0 4.4 4.8 6.1 5.0 5.4 5.3 5.2 24.2 30.8 23.6 22.7 19.5 22.8 15.7 14.9 15.0 14.7 18.4 18.4 13.5 11.7 13.8 13.7 15.3 16.6 17.1 7.2
7.5 6.2 5.5 5.5 6.0 6.3 5.2 4.9 4.6 4.9 4.8 5.2 6.1 6.7 7.6 9.0 19.6 18.1 19.7 16.1 20.2 13.9 7.5 9.6 21.3 30.0 20.4 15.6 12.0 11.2 8.0 7.8 7.5 11.3 11.2 7.5
4.6 4.5 4.7 5.1 5.3 5.2 4.6 4.5 4.8 5.1 4.0 4.2 5.3 5.6 5.7 7.2 4.5 4.2 4.0 7.1 4.0 3.3 3.9 4.0 3.8 3.0 3.6 6.3 8.4 7.6 6.9 7.7 7.7 8.4 8.4 9.2
4.7 4.2 5.0 5.7 6.6 7.3 8.7 7.6 6.0 5.2 4.2 4.1 4.4 4.4 5.0 4.7 4.7 4.4 3.4 2.8 3.6 3.3 3.7 4.2 4.6 2.5 3.9 5.8 6.5 4.7 5.4 7.2 5.8 7.1 10.3
4.9 4.6 4.7 4.5 4.7 4.9 3.8 4.8 4.6 5.7 5.3 4.8 3.9 4.2 4.8 5.5 6.4 14.2 14.4 10.5 3.8 3.5 4.9 4.3 5.2 5.4 5.3 13.1 13.9 15.1 12.4 11.1 10.4 12.9 7.9 6.2
6.3 4.7 4.9 4.4 4.1 4.4 4.2 4.4 4.5 4.9 5.3 6.1 4.9 4.4 4.8 5.0 9.8 14.4 14.4 12.7 6.0 6.9 5.6 5.5 10.9 11.1 13.6 8.6 12.1 8.3 8.1 10.0 10.6 11.5 12.8 6.9
4.6 4.2 4.6 4.3 5.4 5.1 4.6 4.8 5.2 5.2 5.1 5.7 5.0 5.2 6.1 6.0 8.3 8.6 9.8 12.0 12.6 14.2 9.8 11.8 12.1 10.0 9.7 10.1 6.7 7.9 9.0 8.7 6.3 7.7 7.6 5.8
4.6 4.0 4.1 3.8 4.5 5.0 4.9 4.9 4.6 4.6 5.0 4.8 4.6 5.0 6.6 8.1 8.4 9.0 8.7 10.1 9.7 10.7 10.3 10.9 11.7 10.2 10.1 9.4 9.7 7.5 8.9 8.0 7.6 8.2 8.3 6.8
8.7 10.9 8.6 9.5 9.2 10.4 10.7 9.1 9.3 9.4 10.6 8.3 8.6 8.9

Figure 20. SATOB 101 - 400 hPa mean daily count. DECEMBER 2002
Global average number of observations in 24 hours = 186709



		1	7	11	8	1			0	0	1	0				3	3	2	2			0	0	1	1										
13	42	83	124	163	134	127	172	107	50	41	45	78	49	143	391	448	441	459	348	234	132	65	94	101	89	68	27	1		0	0	0	0	0	
130	189	185	274	368	441	507	352	391	199	112	141	125	527	1129	1313	1432	1228	1104	1249	1068	789	441	262	289	301	265	207	128	22	6	4	4	5	9	32
348	758	601	513	483	533	713	559	677	433	458	599	582	1597	2002	2119	1765	1223	962	1346	1417	1166	955	470	429	346	424	473	418	202	23	16	19	23	38	222
222	303	251	257	368	403	729	1145	873	676	560	445	430	854	1048	1356	1637	1435	1306	1152	855	702	834	554	256	219	159	279	306	277	21	30	36	36	26	166
272	310	571	680	617	721	1014	1365	311	279	427	155	72	105	385	611	942	1275	1206	1141	883	581	294	309	667	896	910	812	612	375	46	11	12	22	24	65
936	812	742	657	718	787	535	601	220	449	726	520	480	568	835	635	562	417	789	1009	1032	980	413	996	1058	1204	1062	1101	858	562	144	24	30	35	57	76
815	870	887	385	182	140	28	33	57	97	634	750	1084	903	539	458	455	191	293	1065	1332	1342	998	1171	1123	1114	1190	1059	813	533	470	33	36	38	53	65
755	673	788	789	421	136	9	10	17	55	413	593	1073	1146	899	515	457	315	234	1074	1368	1284	1322	1377	1080	973	674	560	472	378	75	27	28	20	26	155
227	276	433	647	731	589	403	143	101	59	42	222	563	982	978	953	601	431	309	449	880	1057	872	984	732	556	432	383	263	135	28	25	18	20	19	141
233	362	339	302	336	468	709	323	235	208	136	175	385	627	650	773	664	571	368	505	629	711	610	448	526	582	538	459	456	181	34	29	25	17	27	167
92	112	105	85	59	82	149	121	131	144	95	108	123	206	312	300	297	347	368	455	709	734	591	447	390	381	390	360	247	49	31	27	27	26	22	40
													0	36	98	128	157	160	128	135	160	121	145	144	145	133	79	1							
																0	0	0	0			0	0	1	1										

Figure 21. SATOB 101 - 400 hPa vector mean wind. DECEMBER 2002
All observations
Arrows are plotted where greater than 10 obs are present

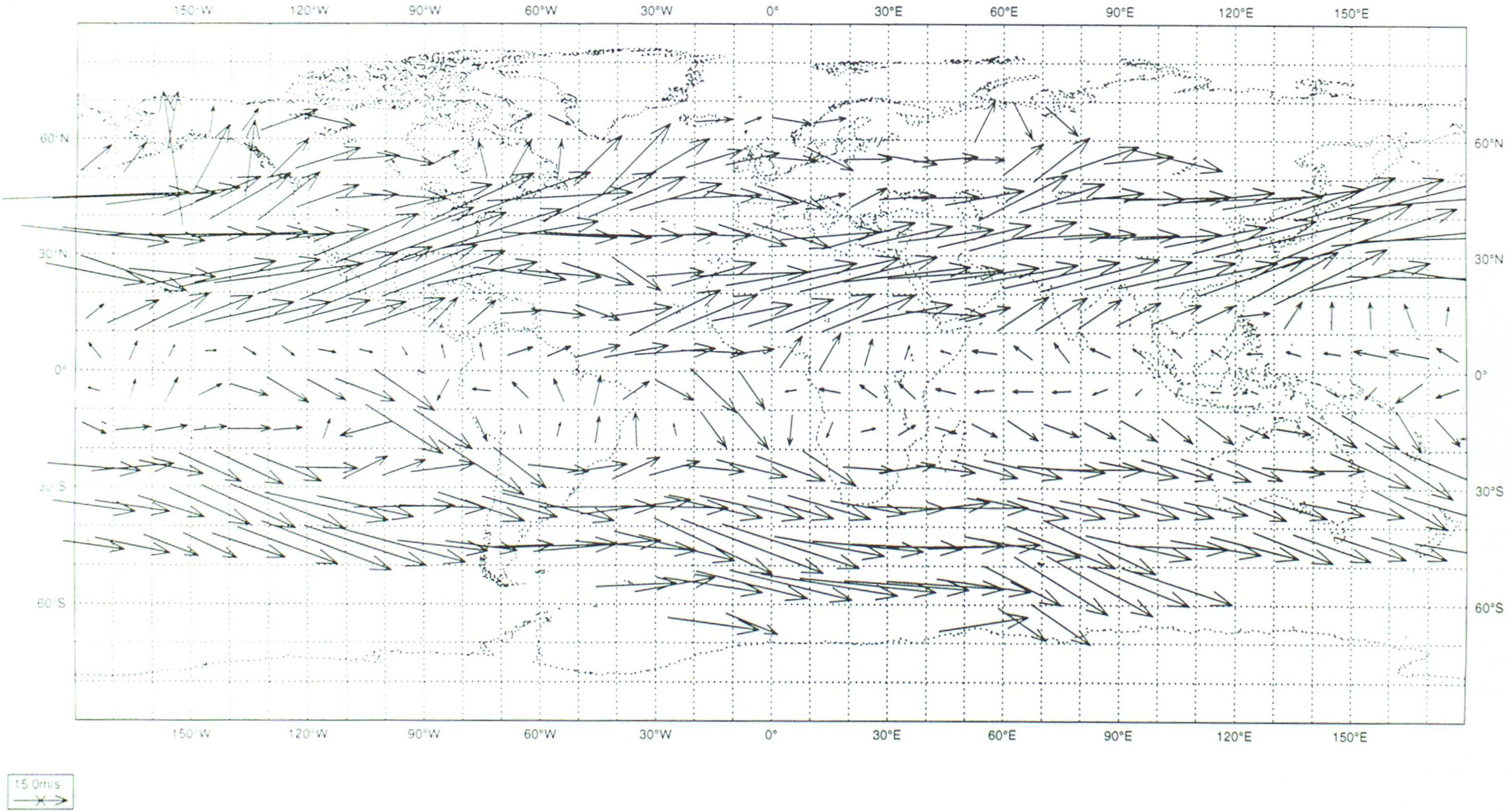

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
15.0m/s

Figure 22. SATOB 101 - 400 hPa mean vector wind differences. DECEMBER 2002
All observations
Arrows are plotted where greater than 10 obs are present

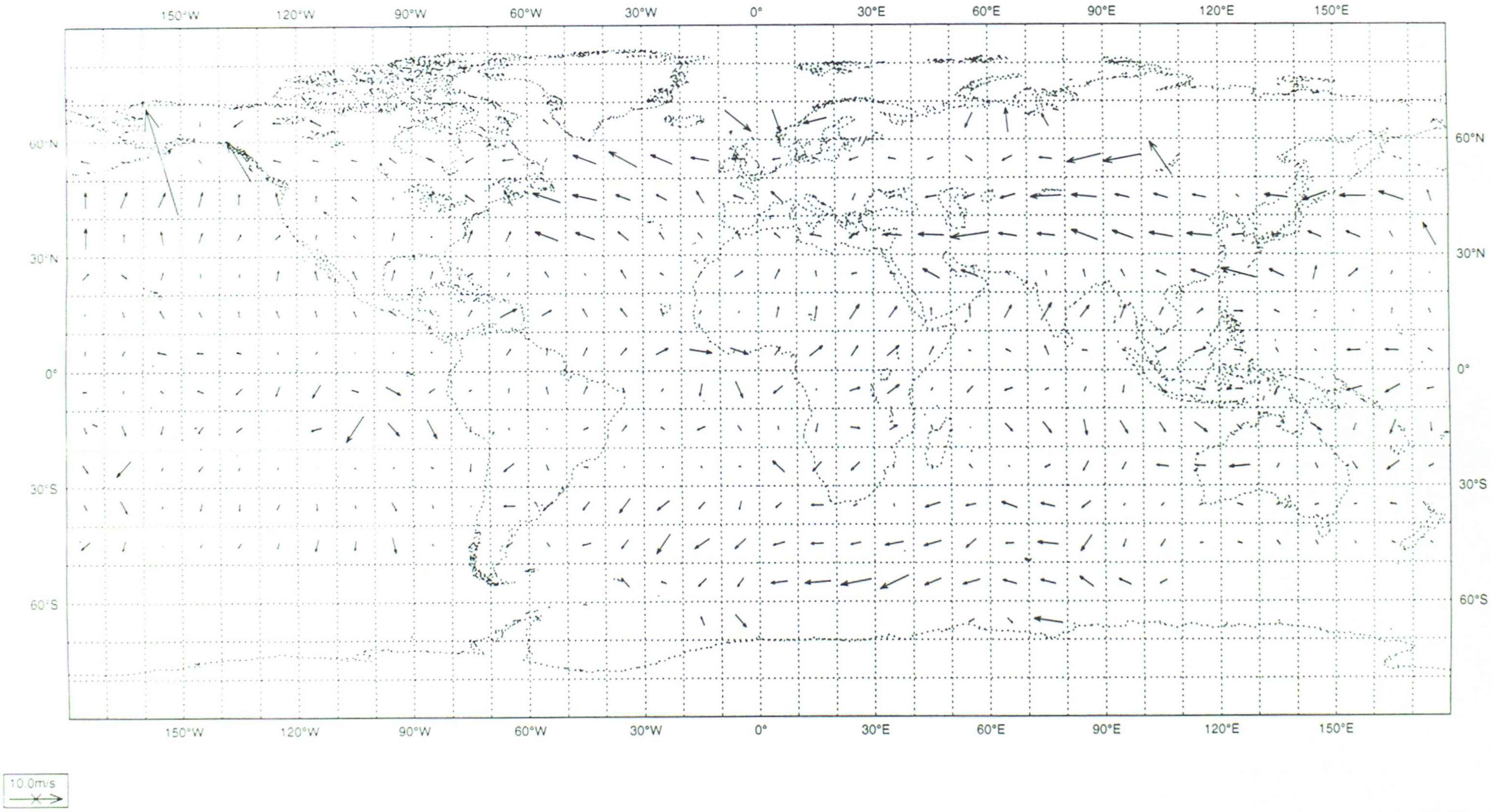

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
10.0m/s

Figure 23. SATOB 101 - 400 hPa mean O-B speed differences (ms-1). DECEMBER 2002
All observations
Values are plotted where greater than 10 obs are present

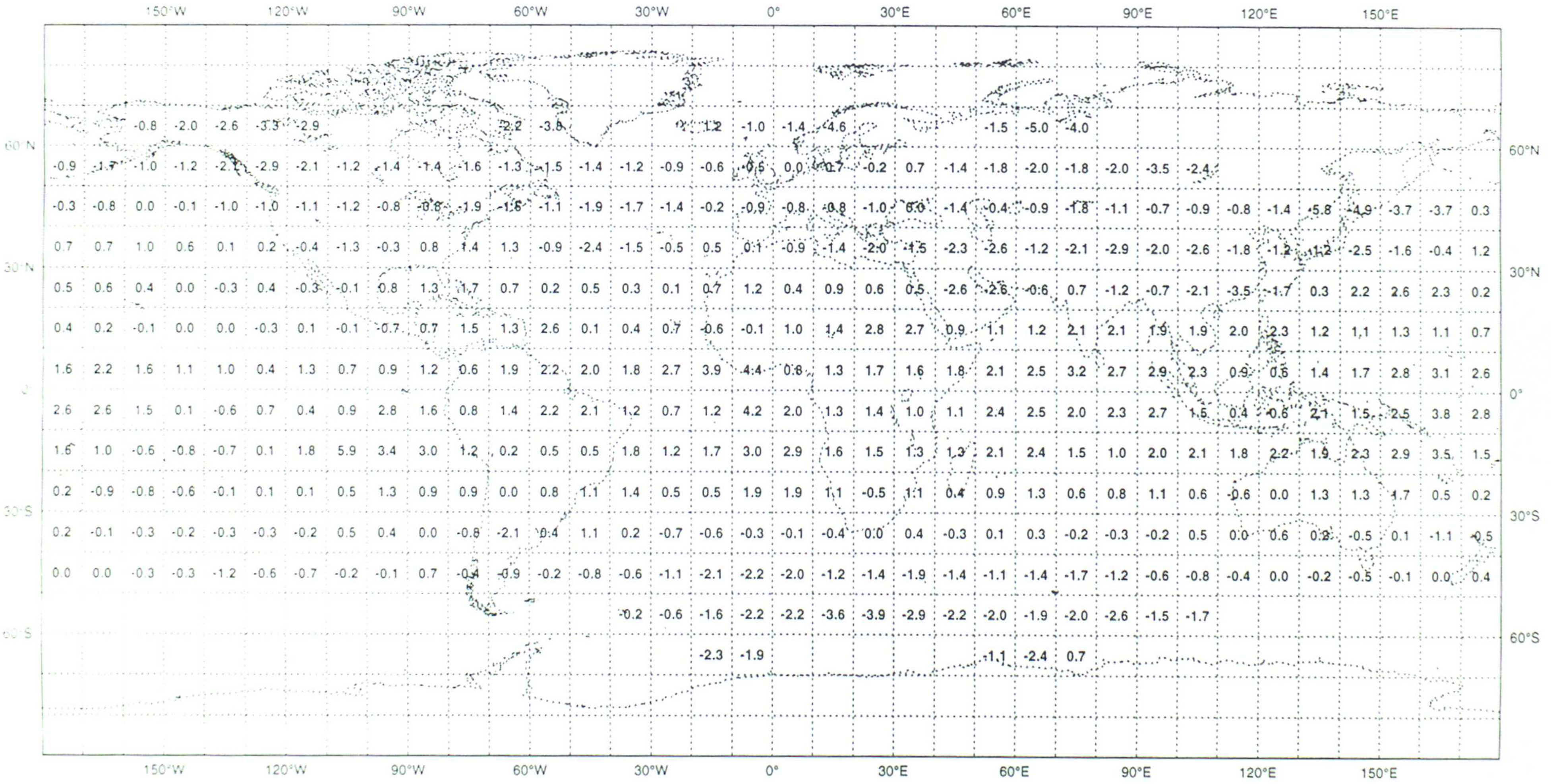
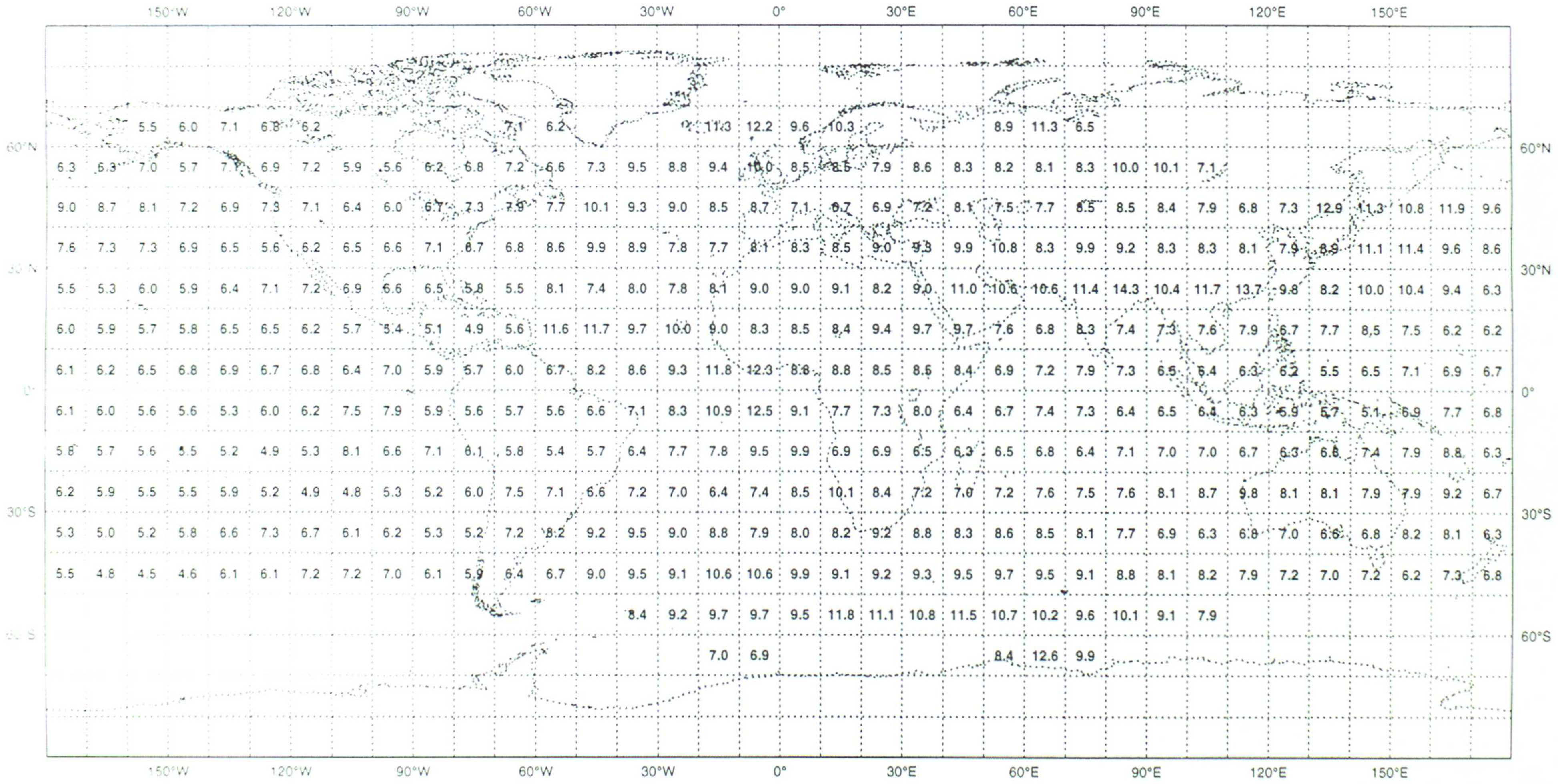

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-0.8 -2.0 -2.6 -3.3 -2.9 2.2 -3.8 1.2 -1.0 -1.4 -4.6 -1.5 -5.0 -4.0
-0.9 -1.7 -1.0 -1.2 -2.1 -2.9 -2.1 -1.2 -1.4 -1.4 -1.6 -1.3 -1.5 -1.4 -1.2 -0.9 -0.6 -0.6 0.0 -0.7 -0.2 0.7 -1.4 -1.8 -2.0 -1.8 -2.0 -3.5 -2.4
-0.3 -0.8 0.0 -0.1 -1.0 -1.0 -1.1 -1.2 -0.8 -0.8 -1.9 -1.6 -1.1 -1.9 -1.7 -1.4 -0.2 -0.9 -0.8 -0.8 -1.0 0.0 -1.4 -0.4 -0.9 -1.8 -1.1 -0.7 -0.9 -0.8 -1.4 -5.8 -4.9 -3.7 -3.7 0.3
0.7 0.7 1.0 0.6 0.1 0.2 -0.4 -1.3 -0.3 0.8 1.4 1.3 -0.9 -2.4 -1.5 -0.5 0.5 0.1 -0.9 -1.4 -2.0 -1.5 -2.3 -2.6 -1.2 -2.1 -2.9 -2.0 -2.6 -1.8 -1.2 -1.2 -2.5 -1.6 -0.4 1.2
0.5 0.6 0.4 0.0 -0.3 0.4 -0.3 -0.1 0.8 1.3 1.7 0.7 0.2 0.5 0.3 0.1 0.7 1.2 0.4 0.9 0.6 0.5 -2.6 -2.6 -0.6 0.7 -1.2 -0.7 -2.1 -3.5 -1.7 0.3 2.2 2.6 2.3 0.2
0.4 0.2 -0.1 0.0 0.0 -0.3 0.1 -0.1 -0.7 0.7 1.5 1.3 2.6 0.1 0.4 0.7 -0.6 -0.1 1.0 1.4 2.8 2.7 0.9 1.1 1.2 2.1 2.1 1.9 1.9 2.0 2.3 1.2 1.1 1.3 1.1 0.7
1.6 2.2 1.6 1.1 1.0 0.4 1.3 0.7 0.9 1.2 0.6 1.9 2.2 2.0 1.8 2.7 3.9 4.4 0.8 1.3 1.7 1.6 1.8 2.1 2.5 3.2 2.7 2.9 2.3 0.9 0.5 1.4 1.7 2.8 3.1 2.6
2.6 2.6 1.5 0.1 -0.6 0.7 0.4 0.9 2.8 1.6 0.8 1.4 2.2 2.1 1.2 0.7 1.2 4.2 2.0 1.3 1.4 1.0 1.1 2.4 2.5 2.0 2.3 2.7 1.5 0.4 0.6 2.1 1.5 2.5 3.8 2.8
1.6 1.0 -0.6 -0.8 -0.7 0.1 1.8 5.9 3.4 3.0 1.2 0.2 0.5 0.5 1.8 1.2 1.7 3.0 2.9 1.6 1.5 1.3 1.3 2.1 2.4 1.5 1.0 2.0 2.1 1.8 2.2 1.9 2.3 2.9 3.5 1.5
0.2 -0.9 -0.8 -0.6 -0.1 0.1 0.1 0.5 1.3 0.9 0.9 0.0 0.8 1.1 1.4 0.5 0.5 1.9 1.9 1.1 -0.5 1.1 0.4 0.9 1.3 0.6 0.8 1.1 0.6 0.6 0.0 1.3 1.3 1.7 0.5 0.2
0.2 -0.1 -0.3 -0.2 -0.3 -0.3 -0.2 0.5 0.4 0.0 -0.8 -2.1 0.4 1.1 0.2 -0.7 -0.6 -0.3 -0.1 -0.4 0.0 0.4 -0.3 0.1 0.3 -0.2 -0.3 -0.2 0.5 0.0 0.6 0.2 -0.5 0.1 -1.1 -0.5
0.0 0.0 -0.3 -0.3 -1.2 -0.6 -0.7 -0.2 -0.1 0.7 -0.4 -0.9 -0.2 -0.8 -0.6 -1.1 -2.1 -2.2 -2.0 -1.2 -1.4 -1.9 -1.4 -1.1 -1.4 -1.7 -1.2 -0.6 -0.8 -0.4 0.0 -0.2 -0.5 -0.1 0.0 0.4
-0.2 -0.6 -1.6 -2.2 -2.2 -3.6 -3.9 -2.9 -2.2 -2.0 -1.9 -2.0 -2.6 -1.5 -1.7
-2.3 -1.9 -1.1 -2.4 0.7

Figure 24. SATOB 101 - 400 hPa mean RMS O-B vector differences (ms-1). DECEMBER 2002
All observations
Values are plotted where greater than 10 obs are present


150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
5.5 6.0 7.1 6.8 6.2 7.1 6.2 11.3 12.2 9.6 10.3 8.9 11.3 6.5
6.3 6.3 7.0 5.7 7.1 6.9 7.2 5.9 5.6 6.2 6.8 7.2 6.6 7.3 9.5 8.8 9.4 10.0 8.5 8.5 7.9 8.6 8.3 8.2 8.1 8.3 10.0 10.1 7.1
9.0 8.7 8.1 7.2 6.9 7.3 7.1 6.4 6.0 6.7 7.3 7.9 7.7 10.1 9.3 9.0 8.5 8.7 7.1 6.7 6.9 7.2 8.1 7.5 7.7 8.5 8.5 8.4 7.9 6.8 7.3 12.9 11.3 10.8 11.9 9.6
7.6 7.3 7.3 6.9 6.5 5.6 6.2 6.5 6.6 7.1 6.7 6.8 8.6 9.9 8.9 7.8 7.7 8.1 8.3 8.5 9.0 9.3 9.9 10.8 8.3 9.9 9.2 8.3 8.3 8.1 7.9 8.9 11.1 11.4 9.6 8.6
5.5 5.3 6.0 5.9 6.4 7.1 7.2 6.9 6.6 6.5 5.8 5.5 8.1 7.4 8.0 7.8 8.1 9.0 9.0 9.1 8.2 9.0 11.0 10.6 10.6 11.4 14.3 10.4 11.7 13.7 9.8 8.2 10.0 10.4 9.4 6.3
6.0 5.9 5.7 5.8 6.5 6.5 6.2 5.7 5.4 5.1 4.9 5.6 11.6 11.7 9.7 10.0 9.0 8.3 8.5 8.4 9.4 9.7 9.7 7.6 6.8 8.3 7.4 7.3 7.6 7.9 6.7 7.7 8.5 7.5 6.2 6.2
6.1 6.2 6.5 6.8 6.9 6.7 6.8 6.4 7.0 5.9 5.7 6.0 6.7 8.2 8.6 9.3 11.8 12.3 8.8 8.8 8.5 8.5 8.4 6.9 7.2 7.9 7.3 6.5 6.4 6.3 6.2 5.5 6.5 7.1 6.9 6.7
6.1 6.0 5.6 5.6 5.3 6.0 6.2 7.5 7.9 5.9 5.6 5.7 5.6 6.6 7.1 8.3 10.9 12.5 9.1 7.7 7.3 8.0 6.4 6.7 7.4 7.3 6.4 6.5 6.4 6.3 5.9 5.7 5.1 5.9 7.7 6.8
5.8 5.7 5.6 5.5 5.2 4.9 5.3 8.1 6.6 7.1 6.1 5.8 5.4 5.7 6.4 7.7 7.8 9.5 9.9 6.9 6.9 6.5 6.3 6.5 6.8 6.4 7.1 7.0 7.0 6.7 6.3 6.8 7.4 7.9 8.8 6.3
6.2 5.9 5.5 5.5 5.9 5.2 4.9 4.8 5.3 5.2 6.0 7.5 7.1 6.6 7.2 7.0 6.4 7.4 8.5 10.1 8.4 7.2 7.0 7.2 7.6 7.5 7.6 8.1 8.7 9.8 8.1 8.1 7.9 7.9 9.2 6.7
5.3 5.0 5.2 5.8 6.6 7.3 6.7 6.1 6.2 5.3 5.2 7.2 8.2 9.2 9.5 9.0 8.8 7.9 8.0 8.2 9.2 8.8 8.3 8.6 8.5 8.1 7.7 6.9 6.3 6.8 7.0 6.6 6.8 8.2 8.1 6.3
5.5 4.8 4.5 4.6 6.1 6.1 7.2 7.2 7.0 6.1 5.9 6.4 6.7 9.0 9.5 9.1 10.6 10.6 9.9 9.1 9.2 9.3 9.5 9.7 9.5 9.1 8.8 8.1 8.2 7.9 7.2 7.0 7.2 6.2 7.3 6.8
8.4 9.2 9.7 9.7 9.5 11.8 11.1 10.8 11.5 10.7 10.2 9.6 10.1 9.1 7.9
7.0 6.9 8.4 12.6 9.9
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

MONITORING OF SATELLITE TEMPERATURES

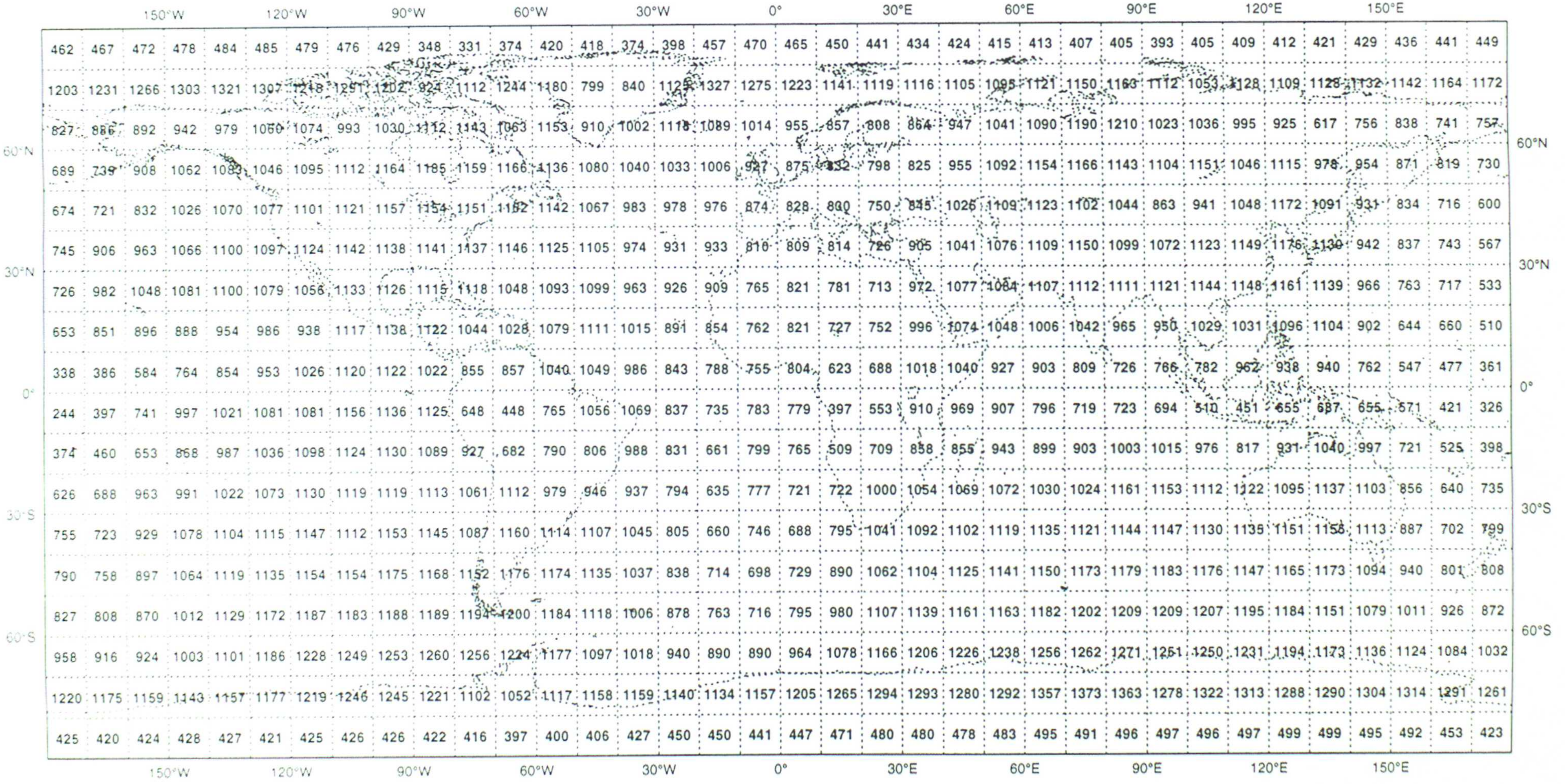
MONITORING CENTRE: BRACKNELL

MONTH: December 2002

Monitoring procedures

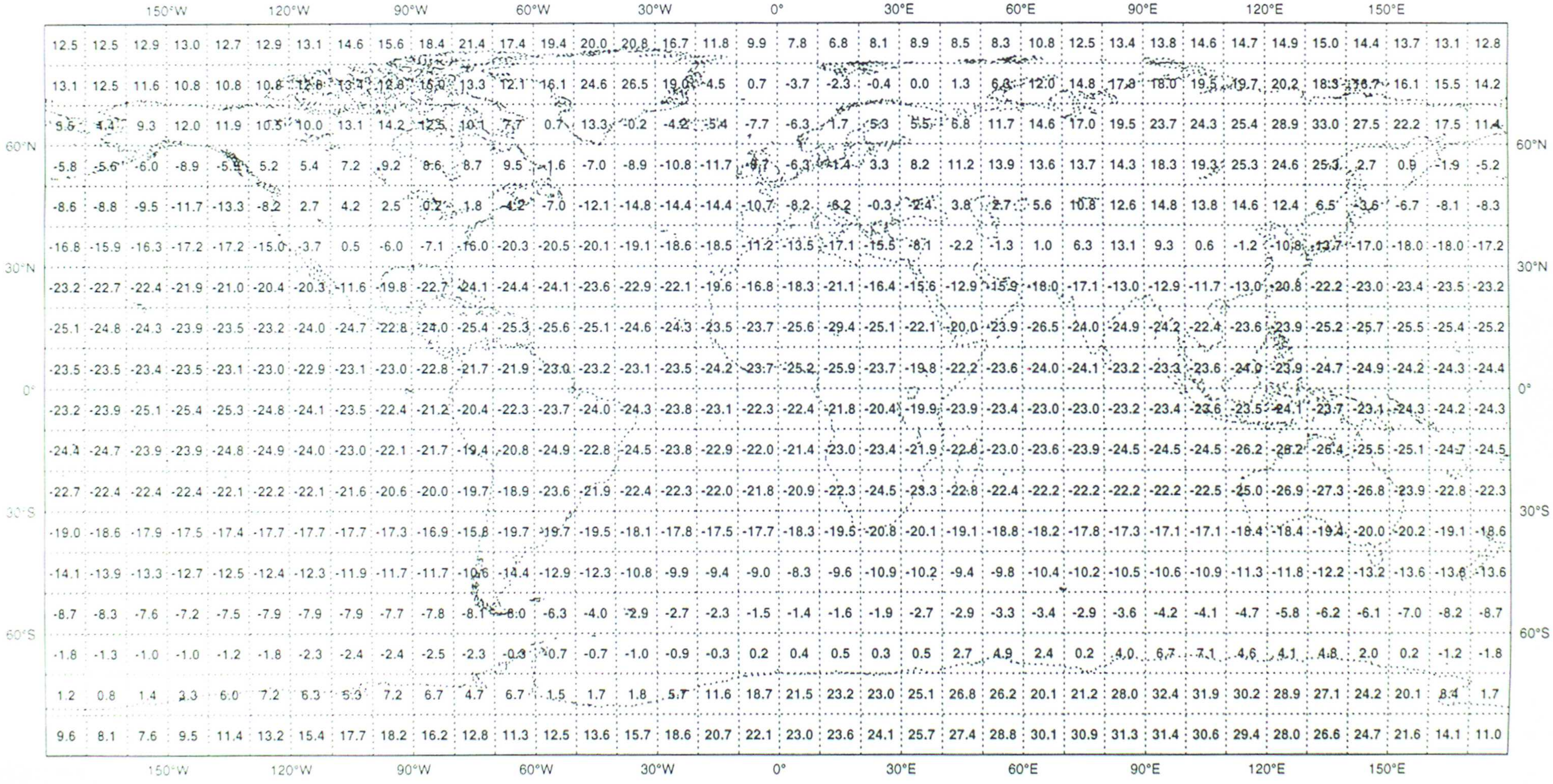
Period	:One calendar month.
Data monitored	:Reports from NOAA-15, NOAA-16 and NOAA-17.
Standard of comparison	:Background field from UKMO global model.
Selection Criteria	:All soundings.
Data Extracted	:Sounding channels (and approximate weighting function peaks, hPa) HIRS8 (Surface) HIRS15 (700) HIRS11 (500-700) HIRS4 (400) AMSUA5 (700) AMSUA7 (300) AMSUA9 (100)
	:Mean and standard deviation observation-minus-background brightness temperature differences

Figure 25. ATOVS mean daily count. DECEMBER 2002
NOAA15, using all observations
Global average number of observations in 24 hours = 603988



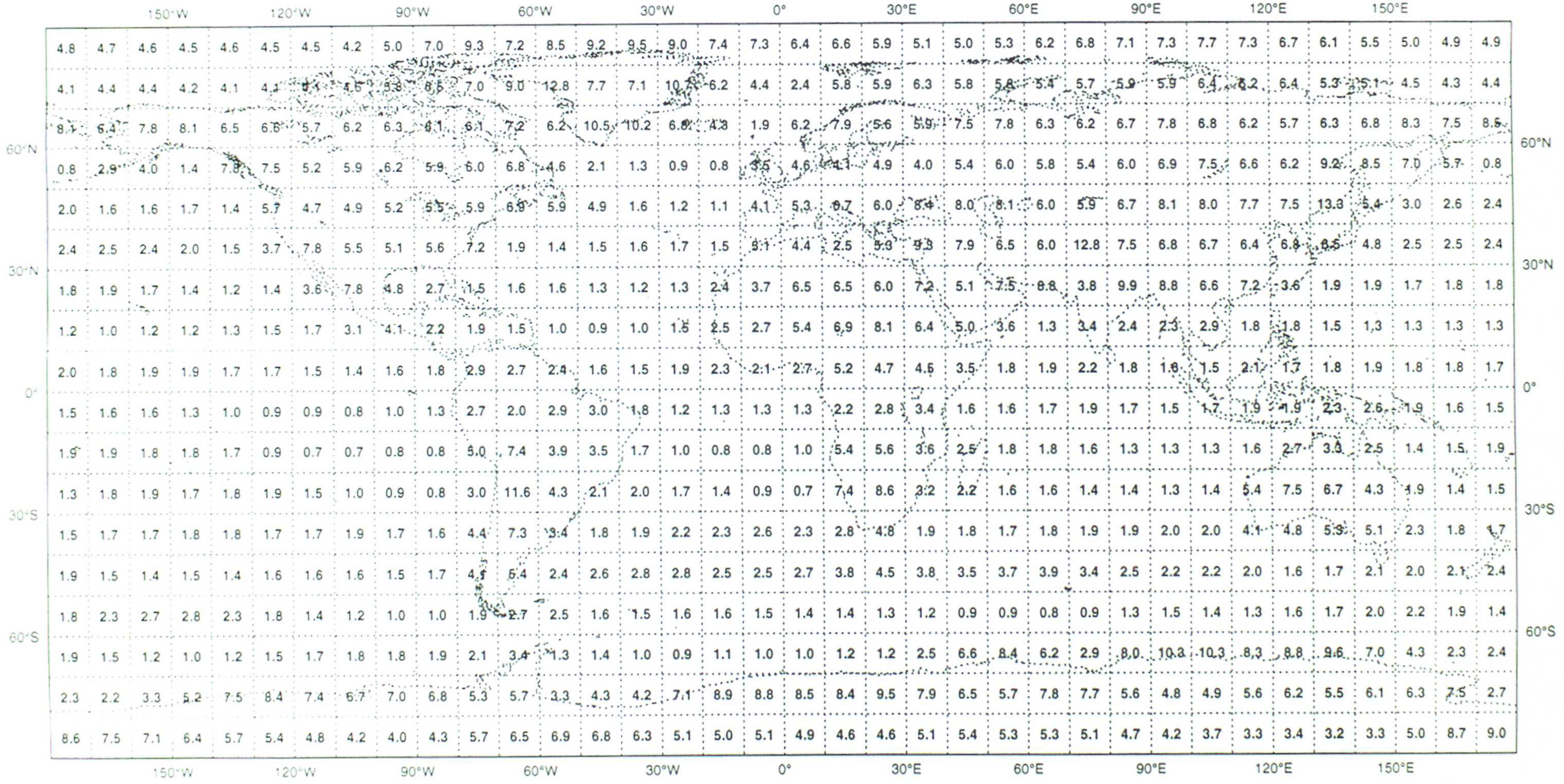
462	467	472	478	484	485	479	476	429	348	331	374	420	418	374	398	457	470	465	450	441	434	424	415	413	407	405	393	405	409	412	421	429	436	441	449
1203	1231	1266	1303	1321	1307	1218	1251	1202	924	1112	1244	1180	799	840	1125	1327	1275	1223	1141	1119	1116	1105	1095	1121	1150	1163	1112	1053	1128	1109	1128	1132	1142	1164	1172
827	886	892	942	979	1060	1074	993	1030	1112	1143	1063	1153	910	1002	1118	1089	1014	955	857	808	864	947	1041	1090	1190	1210	1023	1036	995	925	617	756	838	741	757
689	739	908	1062	1083	1046	1095	1112	1164	1185	1159	1166	1136	1080	1040	1033	1006	927	875	832	798	825	955	1092	1154	1166	1143	1104	1151	1046	1115	978	954	871	819	730
674	721	832	1026	1070	1077	1101	1121	1157	1154	1151	1152	1142	1067	983	978	976	874	828	800	750	845	1026	1109	1123	1102	1044	863	941	1048	1172	1091	931	834	716	600
745	906	963	1066	1100	1097	1124	1142	1138	1141	1137	1146	1125	1105	974	931	933	810	809	814	726	905	1041	1076	1109	1150	1099	1072	1123	1149	1176	1130	942	837	743	567
726	982	1048	1081	1100	1079	1056	1133	1126	1115	1118	1048	1093	1099	963	926	909	765	821	781	713	972	1077	1084	1107	1112	1111	1121	1144	1148	1161	1139	966	763	717	533
653	851	896	888	954	986	938	1117	1138	1122	1044	1028	1079	1111	1015	891	854	762	821	727	752	996	1074	1048	1006	1042	965	950	1029	1031	1096	1104	902	644	660	510
338	386	584	764	854	953	1026	1120	1122	1022	855	857	1040	1049	986	843	788	755	804	623	688	1018	1040	927	903	809	726	766	782	962	938	940	762	547	477	361
244	397	741	997	1021	1081	1081	1156	1136	1125	648	448	765	1056	1069	837	735	783	779	397	553	910	969	907	796	719	723	694	510	451	655	687	655	571	421	326
374	460	653	868	987	1036	1098	1124	1130	1089	927	682	790	806	988	831	661	799	765	509	709	858	855	943	899	903	1003	1015	976	817	931	1040	997	721	525	398
626	688	963	991	1022	1073	1130	1119	1119	1113	1061	1112	979	946	937	794	635	777	721	722	1000	1054	1069	1072	1030	1024	1161	1153	1112	1122	1095	1137	1103	856	640	735
755	723	929	1078	1104	1115	1147	1112	1153	1145	1087	1160	1114	1107	1045	805	660	746	688	795	1041	1092	1102	1119	1135	1121	1144	1147	1130	1135	1151	1156	1113	887	702	799
790	758	897	1064	1119	1135	1154	1154	1175	1168	1152	1176	1174	1135	1037	838	714	698	729	890	1062	1104	1125	1141	1150	1173	1179	1183	1176	1147	1165	1173	1094	940	801	808
827	808	870	1012	1129	1172	1187	1183	1188	1189	1194	1200	1184	1118	1006	878	763	716	795	980	1107	1139	1161	1163	1182	1202	1209	1209	1207	1195	1184	1151	1079	1011	926	872
958	916	924	1003	1101	1186	1228	1249	1253	1260	1256	1224	1177	1097	1018	940	890	890	964	1078	1166	1206	1226	1238	1256	1262	1271	1251	1250	1231	1194	1173	1136	1124	1084	1032
1220	1175	1159	1143	1157	1177	1219	1246	1245	1221	1102	1052	1117	1158	1159	1140	1134	1157	1205	1265	1294	1293	1280	1292	1357	1373	1363	1278	1322	1313	1288	1290	1304	1314	1291	1261
425	420	424	428	427	421	425	426	426	422	416	397	400	406	427	450	450	441	447	471	480	480	478	483	495	491	496	497	496	497	499	499	495	492	453	423

Figure 26. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS8 (Surface)
NOAA15, using all observations



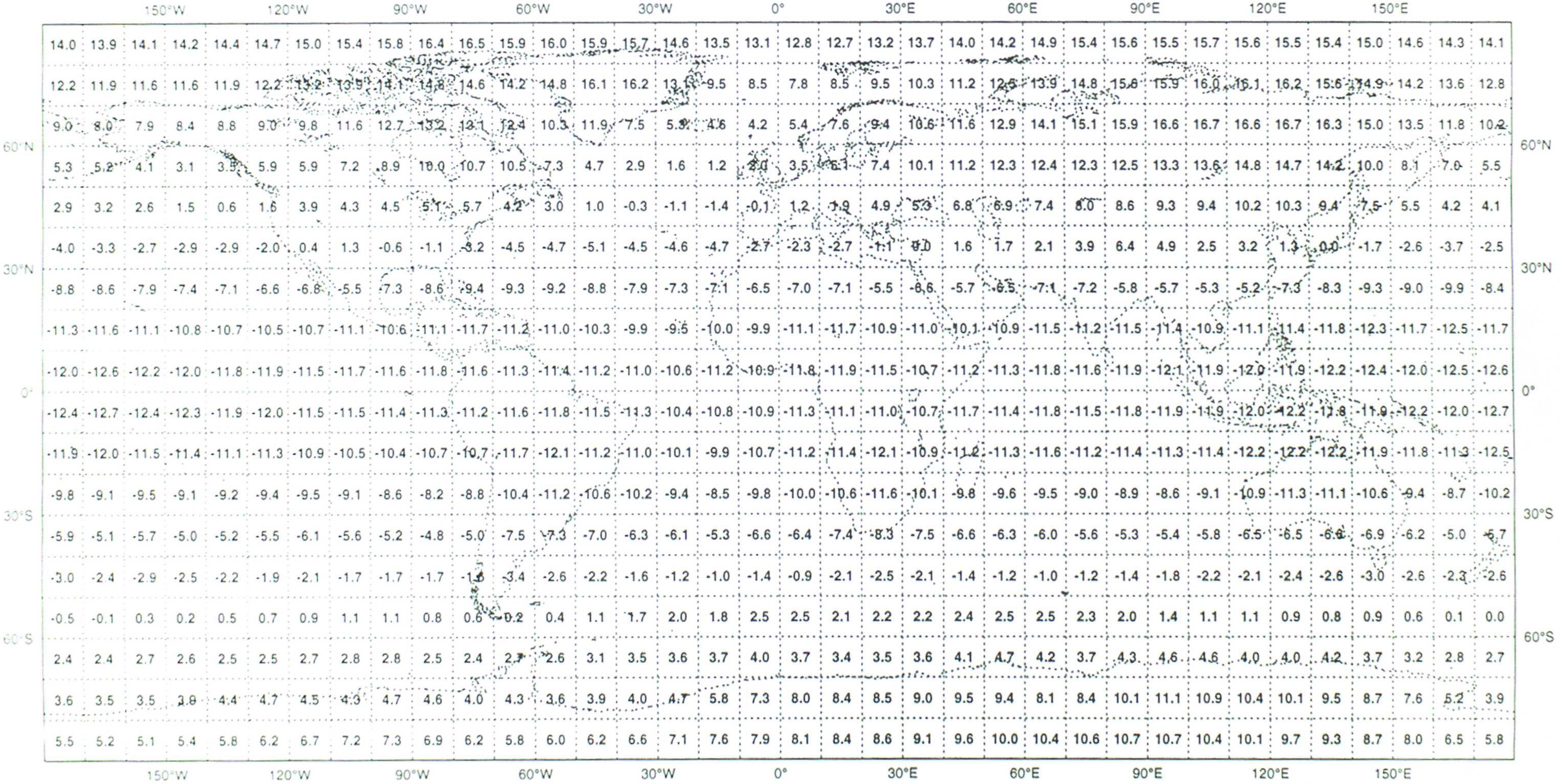
12.5	12.5	12.9	13.0	12.7	12.9	13.1	14.6	15.6	18.4	21.4	17.4	19.4	20.0	20.8	16.7	11.8	9.9	7.8	6.8	8.1	8.9	8.5	8.3	10.8	12.5	13.4	13.8	14.6	14.7	14.9	15.0	14.4	13.7	13.1	12.8
13.1	12.5	11.6	10.8	10.8	10.8	12.6	13.4	12.8	15.0	13.3	12.1	16.1	24.6	26.5	19.0	-4.5	0.7	-3.7	-2.3	-0.4	0.0	1.3	6.3	12.0	14.8	17.8	18.0	19.5	19.7	20.2	18.3	16.7	16.1	15.5	14.2
5.6	4.4	9.3	12.0	11.9	10.5	10.0	13.1	14.2	12.5	10.1	7.7	0.7	13.3	-0.2	-4.2	-5.4	-7.7	-6.3	-1.7	5.3	5.5	6.8	11.7	14.6	17.0	19.5	23.7	24.3	25.4	28.9	33.0	27.5	22.2	17.5	11.4
-5.8	-5.6	-6.0	-8.9	-5.9	5.2	5.4	7.2	9.2	8.6	8.7	9.5	-1.6	-7.0	-8.9	-10.8	-11.7	-9.7	-6.3	-1.4	3.3	8.2	11.2	13.9	13.6	13.7	14.3	18.3	19.3	25.3	24.6	25.3	2.7	0.9	-1.9	-5.2
-8.6	-8.8	-9.5	-11.7	-13.3	-8.2	2.7	4.2	2.5	0.2	1.8	-4.2	-7.0	-12.1	-14.8	-14.4	-14.4	-10.7	-8.2	-6.2	-0.3	-2.4	3.8	2.7	5.6	10.8	12.6	14.8	13.8	14.6	12.4	6.5	-3.6	-6.7	-8.1	-8.3
-16.8	-15.9	-16.3	-17.2	-17.2	-15.0	-3.7	0.5	-6.0	-7.1	-16.0	-20.3	-20.5	-20.1	-19.1	-18.6	-18.5	-11.2	-13.5	-17.1	-15.5	-8.1	-2.2	-1.3	1.0	6.3	13.1	9.3	0.6	-1.2	-10.8	-13.7	-17.0	-18.0	-18.0	-17.2
-23.2	-22.7	-22.4	-21.9	-21.0	-20.4	-20.3	-11.6	-19.8	-22.7	-24.1	-24.4	-24.1	-23.6	-22.9	-22.1	-19.6	-16.8	-18.3	-21.1	-16.4	-15.6	-12.9	-15.9	-18.0	-17.1	-13.0	-12.9	-11.7	-13.0	-20.8	-22.2	-23.0	-23.4	-23.5	-23.2
-25.1	-24.8	-24.3	-23.9	-23.5	-23.2	-24.0	-24.7	-22.8	-24.0	-25.4	-25.3	-25.6	-25.1	-24.6	-24.3	-23.5	-23.7	-25.6	-29.4	-25.1	-22.1	-20.0	-23.9	-26.5	-24.0	-24.9	-24.2	-22.4	-23.6	-23.9	-25.2	-25.7	-25.5	-25.4	-25.2
-23.5	-23.5	-23.4	-23.5	-23.1	-23.0	-22.9	-23.1	-23.0	-22.8	-21.7	-21.9	-23.0	-23.2	-23.1	-23.5	-24.2	-23.7	-25.2	-25.9	-23.7	-19.8	-22.2	-23.6	-24.0	-24.1	-23.2	-23.3	-23.6	-24.0	-23.9	-24.7	-24.9	-24.2	-24.3	-24.4
-23.2	-23.9	-25.1	-25.4	-25.3	-24.8	-24.1	-23.5	-22.4	-21.2	-20.4	-22.3	-23.7	-24.0	-24.3	-23.8	-23.1	-22.3	-22.4	-21.8	-20.4	-19.9	-23.9	-23.4	-23.0	-23.0	-23.2	-23.4	-23.6	-23.5	-24.1	-23.7	-23.1	-24.3	-24.2	-24.3
-24.4	-24.7	-23.9	-23.9	-24.8	-24.9	-24.0	-23.0	-22.1	-21.7	-19.4	-20.8	-24.9	-22.8	-24.5	-23.8	-22.9	-22.0	-21.4	-23.0	-23.4	-21.9	-22.8	-23.0	-23.6	-23.9	-24.5	-24.5	-24.5	-26.2	-28.2	-26.4	-25.5	-25.1	-24.7	-24.5
-22.7	-22.4	-22.4	-22.4	-22.1	-22.2	-22.1	-21.6	-20.6	-20.0	-19.7	-18.9	-23.6	-21.9	-22.4	-22.3	-22.0	-21.8	-20.9	-22.3	-24.5	-23.3	-22.8	-22.4	-22.2	-22.2	-22.2	-22.2	-22.5	-25.0	-26.9	-27.3	-26.8	-23.9	-22.8	-22.3
-19.0	-18.6	-17.9	-17.5	-17.4	-17.7	-17.7	-17.7	-17.3	-16.9	-15.8	-19.7	-19.7	-19.5	-18.1	-17.8	-17.5	-17.7	-18.3	-19.5	-20.8	-20.1	-19.1	-18.8	-18.2	-17.8	-17.3	-17.1	-17.1	-18.4	-18.4	-19.4	-20.0	-20.2	-19.1	-18.6
-14.1	-13.9	-13.3	-12.7	-12.5	-12.4	-12.3	-11.9	-11.7	-11.7	-10.6	-14.4	-12.9	-12.3	-10.8	-9.9	-9.4	-9.0	-8.3	-9.6	-10.9	-10.2	-9.4	-9.8	-10.4	-10.2	-10.5	-10.6	-10.9	-11.3	-11.8	-12.2	-13.2	-13.6	-13.6	-13.6
-8.7	-8.3	-7.6	-7.2	-7.5	-7.9	-7.9	-7.9	-7.7	-7.8	-8.1	-8.0	-6.3	-4.0	-2.9	-2.7	-2.3	-1.5	-1.4	-1.6	-1.9	-2.7	-2.9	-3.3	-3.4	-2.9	-3.6	-4.2	-4.1	-4.7	-5.8	-6.2	-6.1	-7.0	-8.2	-8.7
-1.8	-1.3	-1.0	-1.0	-1.2	-1.8	-2.3	-2.4	-2.4	-2.5	-2.3	-0.3	-0.7	-0.7	-1.0	-0.9	-0.3	0.2	0.4	0.5	0.3	0.5	2.7	4.9	2.4	0.2	4.0	6.7	7.1	4.6	4.1	4.8	2.0	0.2	-1.2	-1.8
1.2	0.8	1.4	3.3	6.0	7.2	6.3	5.3	7.2	6.7	4.7	6.7	1.5	1.7	1.8	5.7	11.6	18.7	21.5	23.2	23.0	25.1	26.8	26.2	20.1	21.2	28.0	32.4	31.9	30.2	28.9	27.1	24.2	20.1	8.4	1.7
9.6	8.1	7.6	9.5	11.4	13.2	15.4	17.7	18.2	16.2	12.8	11.3	12.5	13.6	15.7	18.6	20.7	22.1	23.0	23.6	24.1	25.7	27.4	28.8	30.1	30.9	31.3	31.4	30.6	29.4	28.0	26.6	24.7	21.6	14.1	11.0

Figure 27. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS8 (Surface)
NOAA15, using all observations



4.8	4.7	4.6	4.5	4.6	4.5	4.5	4.2	5.0	7.0	9.3	7.2	8.5	9.2	9.5	9.0	7.4	7.3	6.4	6.6	5.9	5.1	5.0	5.3	6.2	6.8	7.1	7.3	7.7	7.3	6.7	6.1	5.5	5.0	4.9	4.9
4.1	4.4	4.4	4.2	4.1	4.1	[illegible]	4.6	5.3	8.5	7.0	9.0	12.8	7.7	7.1	10.7	6.2	4.4	2.4	5.8	5.9	6.3	5.8	5.8	5.4	5.7	5.9	5.9	6.4	6.2	6.4	5.3	5.1	4.5	4.3	4.4
8.1	6.4	7.8	8.1	6.5	6.6	5.7	6.2	6.3	6.1	6.1	7.2	6.2	10.5	10.2	6.8	4.3	1.9	6.2	7.9	5.6	5.9	7.5	7.8	6.3	6.2	6.7	7.8	6.8	6.2	5.7	6.3	6.8	8.3	7.5	8.5
0.8	2.9	4.0	1.4	7.8	7.5	5.2	5.9	6.2	5.9	6.0	6.8	4.6	2.1	1.3	0.9	0.8	3.5	4.6	4.1	4.9	4.0	5.4	6.0	5.8	5.4	6.0	6.9	7.5	6.6	6.2	9.2	8.5	7.0	5.7	0.8
2.0	1.6	1.6	1.7	1.4	5.7	4.7	4.9	5.2	5.5	5.9	6.9	5.9	4.9	1.6	1.2	1.1	4.1	5.3	6.7	6.0	8.4	8.0	8.1	6.0	5.9	6.7	8.1	8.0	7.7	7.5	13.3	5.4	3.0	2.6	2.4
2.4	2.5	2.4	2.0	1.5	3.7	7.8	5.5	5.1	5.6	7.2	1.9	1.4	1.5	1.6	1.7	1.5	5.1	4.4	2.5	5.3	9.3	7.9	6.5	6.0	12.8	7.5	6.8	6.7	6.4	6.8	8.5	4.8	2.5	2.5	2.4
1.8	1.9	1.7	1.4	1.2	1.4	3.6	7.8	4.8	2.7	1.5	1.6	1.6	1.3	1.2	1.3	2.4	3.7	6.5	6.5	6.0	7.2	5.1	7.5	8.8	3.8	9.9	8.8	6.6	7.2	3.6	1.9	1.9	1.7	1.8	1.8
1.2	1.0	1.2	1.2	1.3	1.5	1.7	3.1	4.1	2.2	1.9	1.5	1.0	0.9	1.0	1.5	2.5	2.7	5.4	6.9	8.1	6.4	5.0	3.6	1.3	3.4	2.4	2.3	2.9	1.8	1.8	1.5	1.3	1.3	1.3	1.3
2.0	1.8	1.9	1.9	1.7	1.7	1.5	1.4	1.6	1.8	2.9	2.7	2.4	1.6	1.5	1.9	2.3	2.1	2.7	5.2	4.7	4.6	3.5	1.8	1.9	2.2	1.8	1.6	1.5	2.1	1.7	1.8	1.9	1.8	1.8	1.7
1.5	1.6	1.6	1.3	1.0	0.9	0.9	0.8	1.0	1.3	2.7	2.0	2.9	3.0	1.8	1.2	1.3	1.3	1.3	2.2	2.8	3.4	1.6	1.6	1.7	1.9	1.7	1.5	1.7	1.9	1.9	2.3	2.6	1.9	1.6	1.5
1.9	1.9	1.8	1.8	1.7	0.9	0.7	0.7	0.8	0.8	5.0	7.4	3.9	3.5	1.7	1.0	0.8	0.8	1.0	5.4	5.6	3.6	2.5	1.8	1.8	1.6	1.3	1.3	1.3	1.6	2.7	3.3	2.5	1.4	1.5	1.9
1.3	1.8	1.9	1.7	1.8	1.9	1.5	1.0	0.9	0.8	3.0	11.6	4.3	2.1	2.0	1.7	1.4	0.9	0.7	7.4	8.6	3.2	2.2	1.6	1.6	1.4	1.4	1.3	1.4	5.4	7.5	6.7	4.3	1.9	1.4	1.5
1.5	1.7	1.7	1.8	1.8	1.7	1.7	1.9	1.7	1.6	4.4	7.3	3.4	1.8	1.9	2.2	2.3	2.6	2.3	2.8	4.8	1.9	1.8	1.7	1.8	1.9	1.9	2.0	2.0	4.1	4.8	5.3	5.1	2.3	1.8	1.7
1.9	1.5	1.4	1.5	1.4	1.6	1.6	1.6	1.5	1.7	4.1	5.4	2.4	2.6	2.8	2.8	2.5	2.5	2.7	3.8	4.5	3.8	3.5	3.7	3.9	3.4	2.5	2.2	2.2	2.0	1.6	1.7	2.1	2.0	2.1	2.4
1.8	2.3	2.7	2.8	2.3	1.8	1.4	1.2	1.0	1.0	1.9	2.7	2.5	1.6	1.5	1.6	1.6	1.5	1.4	1.4	1.3	1.2	0.9	0.9	0.8	0.9	1.3	1.5	1.4	1.3	1.6	1.7	2.0	2.2	1.9	1.4
1.9	1.5	1.2	1.0	1.2	1.5	1.7	1.8	1.8	1.9	2.1	3.4	1.3	1.4	1.0	0.9	1.1	1.0	1.0	1.2	1.2	2.5	6.6	8.4	6.2	2.9	8.0	10.3	10.3	8.3	8.8	9.6	7.0	4.3	2.3	2.4
2.3	2.2	3.3	5.2	7.5	8.4	7.4	6.7	7.0	6.8	5.3	5.7	3.3	4.3	4.2	7.1	8.9	8.8	8.5	8.4	9.5	7.9	6.5	5.7	7.8	7.7	5.6	4.8	4.9	5.6	6.2	5.5	6.1	6.3	7.5	2.7
8.6	7.5	7.1	6.4	5.7	5.4	4.8	4.2	4.0	4.3	5.7	6.5	6.9	6.8	6.3	5.1	5.0	5.1	4.9	4.6	4.6	5.1	5.4	5.3	5.3	5.1	4.7	4.2	3.7	3.3	3.4	3.2	3.3	5.0	8.7	9.0

Figure 28. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS15 (700 hPa)
NOAA15, using all observations



14.0	13.9	14.1	14.2	14.4	14.7	15.0	15.4	15.8	16.4	16.5	15.9	16.0	15.9	15.7	14.6	13.5	13.1	12.8	12.7	13.2	13.7	14.0	14.2	14.9	15.4	15.6	15.5	15.7	15.6	15.5	15.4	15.0	14.6	14.3	14.1
12.2	11.9	11.6	11.6	11.9	12.2	13.2	13.9	14.1	14.8	14.6	14.2	14.8	16.1	16.2	13.1	9.5	8.5	7.8	8.5	9.5	10.3	11.2	12.5	13.9	14.8	15.6	15.9	16.0	16.1	16.2	15.6	14.9	14.2	13.6	12.8
9.0	8.0	7.9	8.4	8.8	9.0	9.8	11.6	12.7	13.2	13.1	12.4	10.3	11.9	7.5	5.9	4.6	4.2	5.4	7.6	9.4	10.6	11.6	12.9	14.1	15.1	15.9	16.6	16.7	16.6	16.7	16.3	15.0	13.5	11.8	10.2
5.3	5.2	4.1	3.1	3.5	5.9	5.9	7.2	8.9	10.0	10.7	10.5	7.3	4.7	2.9	1.6	1.2	2.0	3.5	6.1	7.4	10.1	11.2	12.3	12.4	12.3	12.5	13.3	13.6	14.8	14.7	14.2	10.0	8.1	7.0	5.5
2.9	3.2	2.6	1.5	0.6	1.6	3.9	4.3	4.5	5.1	5.7	4.2	3.0	1.0	-0.3	-1.1	-1.4	-0.1	1.2	1.9	4.9	5.3	6.8	6.9	7.4	8.0	8.6	9.3	9.4	10.2	10.3	9.4	7.5	5.5	4.2	4.1
-4.0	-3.3	-2.7	-2.9	-2.9	-2.0	0.4	1.3	-0.6	-1.1	-3.2	-4.5	-4.7	-5.1	-4.5	-4.6	-4.7	-2.7	-2.3	-2.7	-1.1	0.0	1.6	1.7	2.1	3.9	6.4	4.9	2.5	3.2	1.3	0.0	-1.7	-2.6	-3.7	-2.5
-8.8	-8.6	-7.9	-7.4	-7.1	-6.6	-6.8	-5.5	-7.3	-8.6	-9.4	-9.3	-9.2	-8.8	-7.9	-7.3	-7.1	-6.5	-7.0	-7.1	-5.5	-6.6	-5.7	-6.5	-7.1	-7.2	-5.8	-5.7	-5.3	-5.2	-7.3	-8.3	-9.3	-9.0	-9.9	-8.4
-11.3	-11.6	-11.1	-10.8	-10.7	-10.5	-10.7	-11.1	-10.6	-11.1	-11.7	-11.2	-11.0	-10.3	-9.9	-9.5	-10.0	-9.9	-11.1	-11.7	-10.9	-11.0	-10.1	-10.9	-11.5	-11.2	-11.5	-11.4	-10.9	-11.1	-11.4	-11.8	-12.3	-11.7	-12.5	-11.7
-12.0	-12.6	-12.2	-12.0	-11.8	-11.9	-11.5	-11.7	-11.6	-11.8	-11.6	-11.3	-11.4	-11.2	-11.0	-10.6	-11.2	-10.9	-11.8	-11.9	-11.5	-10.7	-11.2	-11.3	-11.8	-11.6	-11.9	-12.1	-11.9	-12.0	-11.9	-12.2	-12.4	-12.0	-12.5	-12.6
-12.4	-12.7	-12.4	-12.3	-11.9	-12.0	-11.5	-11.5	-11.4	-11.3	-11.2	-11.6	-11.8	-11.5	-11.3	-10.4	-10.8	-10.9	-11.3	-11.1	-11.0	-10.7	-11.7	-11.4	-11.8	-11.5	-11.8	-11.9	-11.9	-12.0	-12.2	-11.8	-11.9	-12.2	-12.0	-12.7
-11.9	-12.0	-11.5	-11.4	-11.1	-11.3	-10.9	-10.5	-10.4	-10.7	-10.7	-11.7	-12.1	-11.2	-11.0	-10.1	-9.9	-10.7	-11.2	-11.4	-12.1	-10.9	-11.2	-11.3	-11.6	-11.2	-11.4	-11.3	-11.4	-12.2	-12.2	-12.2	-11.9	-11.8	-11.3	-12.5
-9.8	-9.1	-9.5	-9.1	-9.2	-9.4	-9.5	-9.1	-8.6	-8.2	-8.8	-10.4	-11.2	-10.6	-10.2	-9.4	-8.5	-9.8	-10.0	-10.6	-11.6	-10.1	-9.8	-9.6	-9.5	-9.0	-8.9	-8.6	-9.1	-10.9	-11.3	-11.1	-10.6	-9.4	-8.7	-10.2
-5.9	-5.1	-5.7	-5.0	-5.2	-5.5	-6.1	-5.6	-5.2	-4.8	-5.0	-7.5	-7.3	-7.0	-6.3	-6.1	-5.3	-6.6	-6.4	-7.4	-8.3	-7.5	-6.6	-6.3	-6.0	-5.6	-5.3	-5.4	-5.8	-6.5	-6.5	-6.6	-6.9	-6.2	-5.0	-5.7
-3.0	-2.4	-2.9	-2.5	-2.2	-1.9	-2.1	-1.7	-1.7	-1.7	-1.6	-3.4	-2.6	-2.2	-1.6	-1.2	-1.0	-1.4	-0.9	-2.1	-2.5	-2.1	-1.4	-1.2	-1.0	-1.2	-1.4	-1.8	-2.2	-2.1	-2.4	-2.6	-3.0	-2.6	-2.3	-2.6
-0.5	-0.1	0.3	0.2	0.5	0.7	0.9	1.1	1.1	0.8	0.6	0.2	0.4	1.1	1.7	2.0	1.8	2.5	2.5	2.1	2.2	2.2	2.4	2.5	2.5	2.3	2.0	1.4	1.1	1.1	0.9	0.8	0.9	0.6	0.1	0.0
2.4	2.4	2.7	2.6	2.5	2.5	2.7	2.8	2.8	2.5	2.4	2.7	2.6	3.1	3.5	3.6	3.7	4.0	3.7	3.4	3.5	3.6	4.1	4.7	4.2	3.7	4.3	4.6	4.6	4.0	4.0	4.2	3.7	3.2	2.8	2.7
3.6	3.5	3.5	3.8	4.4	4.7	4.5	4.3	4.7	4.6	4.0	4.3	3.6	3.9	4.0	4.7	5.8	7.3	8.0	8.4	8.5	9.0	9.5	9.4	8.1	8.4	10.1	11.1	10.9	10.4	10.1	9.5	8.7	7.6	5.2	3.9
5.5	5.2	5.1	5.4	5.8	6.2	6.7	7.2	7.3	6.9	6.2	5.8	6.0	6.2	6.6	7.1	7.6	7.9	8.1	8.4	8.6	9.1	9.6	10.0	10.4	10.6	10.7	10.7	10.4	10.1	9.7	9.3	8.7	8.0	6.5	5.8

Figure 29. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS15 (700 hPa)
NOAA15, using all observations

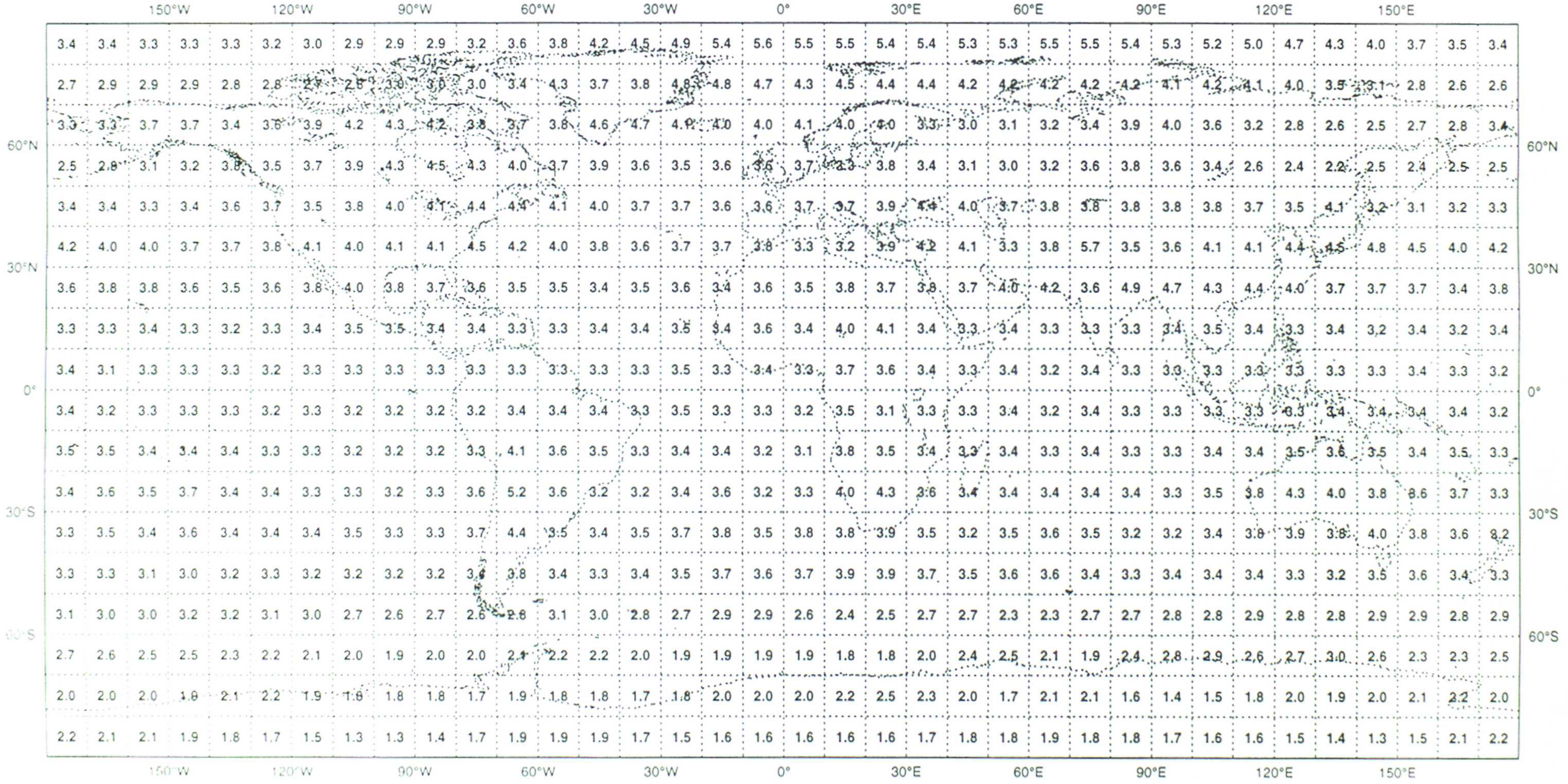
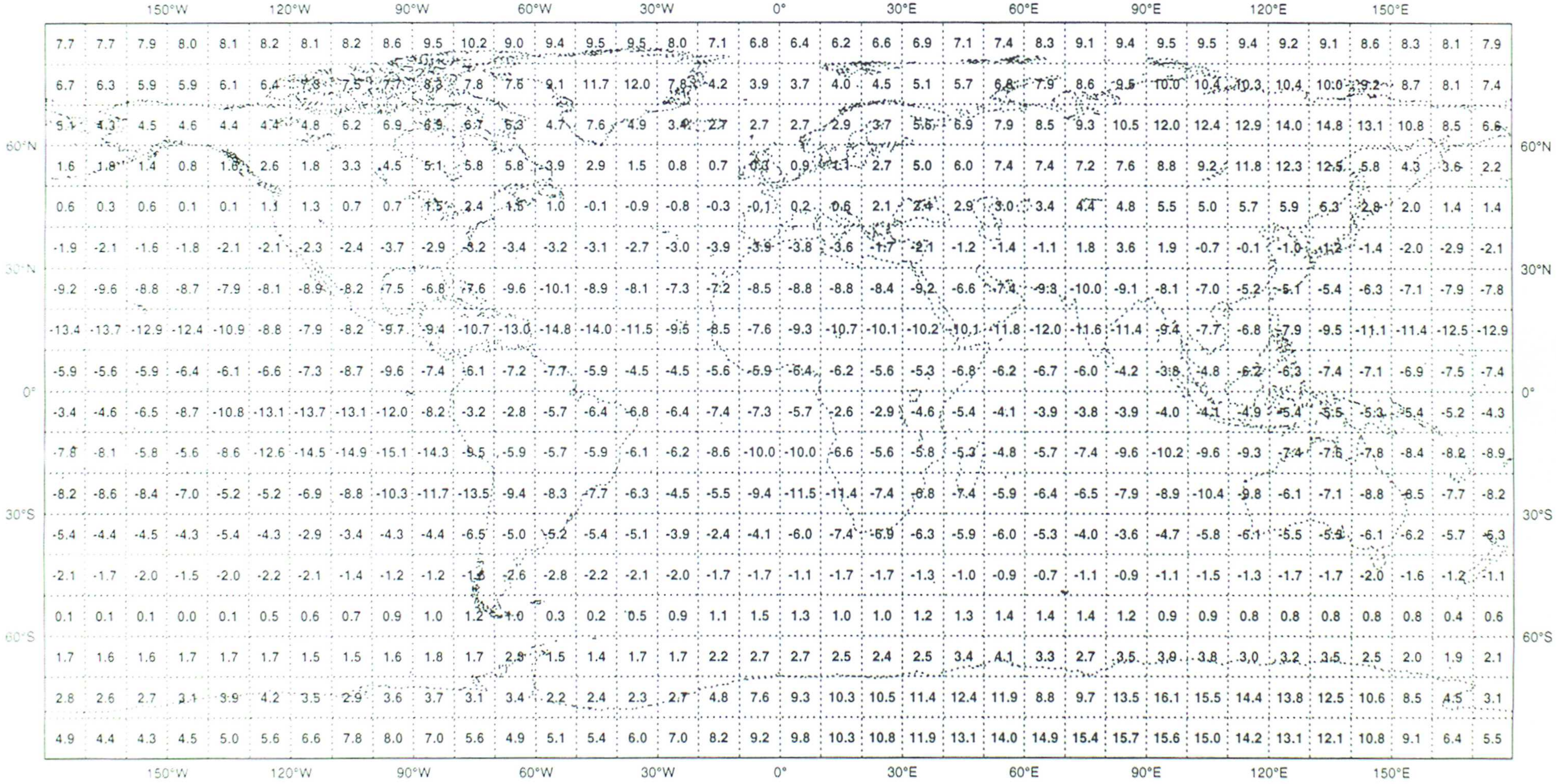
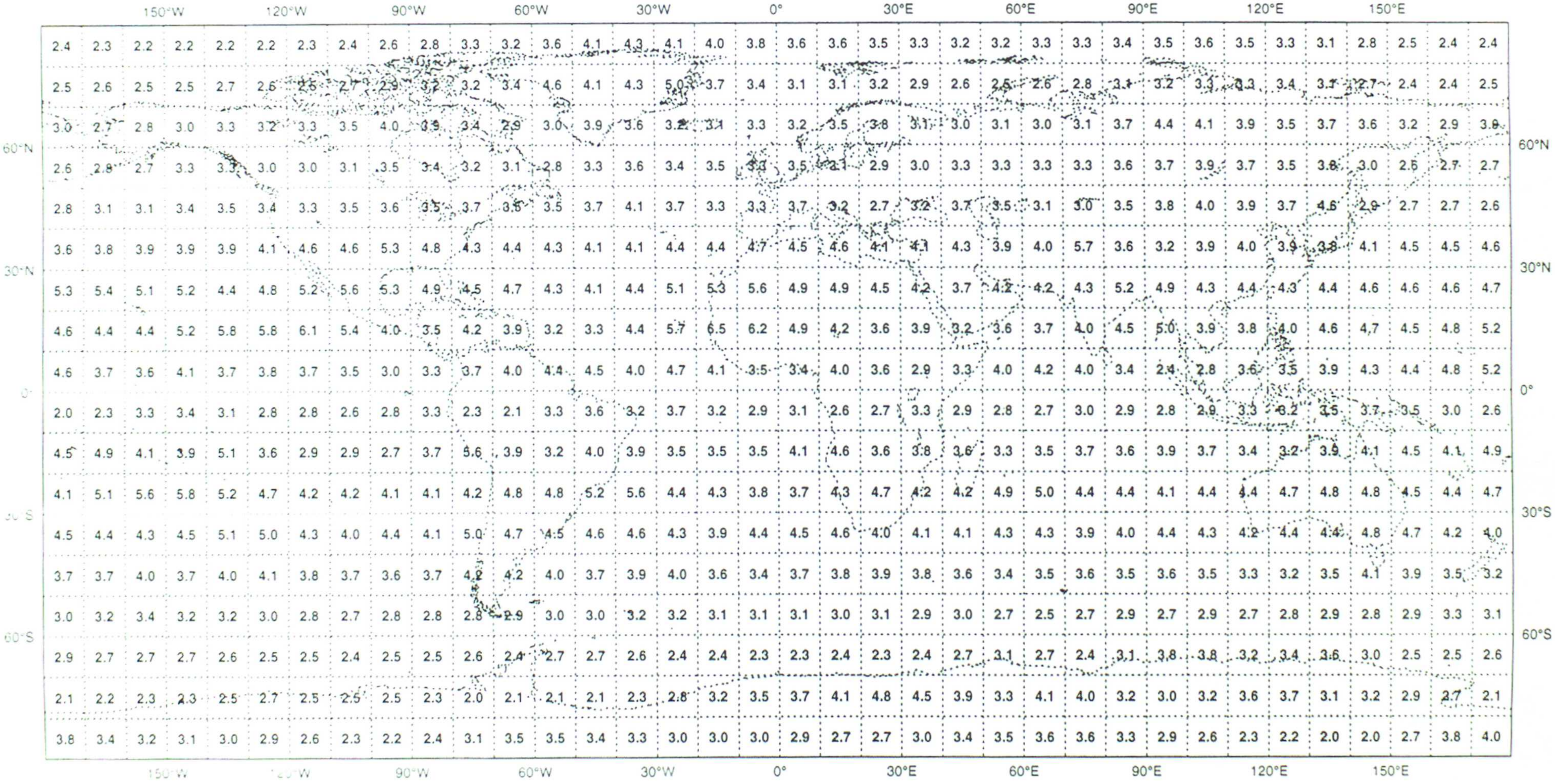

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
3.4 3.4 3.3 3.3 3.3 3.2 3.0 2.9 2.9 2.9 3.2 3.6 3.8 4.2 4.5 4.9 5.4 5.6 5.5 5.5 5.4 5.4 5.3 5.3 5.5 5.5 5.4 5.3 5.2 5.0 4.7 4.3 4.0 3.7 3.5 3.4
2.7 2.9 2.9 2.9 2.8 2.8 2.7 2.8 3.0 3.0 3.0 3.4 4.3 3.7 3.8 4.8 4.8 4.7 4.3 4.5 4.4 4.4 4.2 4.2 4.2 4.2 4.2 4.1 4.2 4.1 4.0 3.5 3.1 2.8 2.6 2.6
3.3 3.3 3.7 3.7 3.4 3.6 3.9 4.2 4.3 4.2 3.8 3.7 3.8 4.6 4.7 4.9 4.0 4.0 4.1 4.0 4.0 3.3 3.0 3.1 3.2 3.4 3.9 4.0 3.6 3.2 2.8 2.6 2.5 2.7 2.8 3.4
2.5 2.8 3.1 3.2 3.8 3.5 3.7 3.9 4.3 4.5 4.3 4.0 3.7 3.9 3.6 3.5 3.6 3.6 3.7 2.3 3.8 3.4 3.1 3.0 3.2 3.6 3.8 3.6 3.4 2.6 2.4 2.2 2.5 2.4 2.5 2.5
3.4 3.4 3.3 3.4 3.6 3.7 3.5 3.8 4.0 4.1 4.4 4.4 4.1 4.0 3.7 3.7 3.6 3.6 3.7 3.7 3.9 4.4 4.0 3.7 3.8 3.8 3.8 3.8 3.8 3.7 3.5 4.1 3.2 3.1 3.2 3.3
4.2 4.0 4.0 3.7 3.7 3.8 4.1 4.0 4.1 4.1 4.5 4.2 4.0 3.8 3.6 3.7 3.7 3.8 3.3 3.2 3.9 4.2 4.1 3.3 3.8 5.7 3.5 3.6 4.1 4.1 4.4 4.5 4.8 4.5 4.0 4.2
3.6 3.8 3.8 3.6 3.5 3.6 3.8 4.0 3.8 3.7 3.6 3.5 3.5 3.4 3.5 3.6 3.4 3.6 3.5 3.8 3.7 3.8 3.7 4.0 4.2 3.6 4.9 4.7 4.3 4.4 4.0 3.7 3.7 3.7 3.4 3.8
3.3 3.3 3.4 3.3 3.2 3.3 3.4 3.5 3.5 3.4 3.4 3.3 3.3 3.4 3.4 3.5 3.4 3.6 3.4 4.0 4.1 3.4 3.3 3.4 3.3 3.3 3.3 3.4 3.5 3.4 3.3 3.4 3.2 3.4 3.2 3.4
3.4 3.1 3.3 3.3 3.3 3.2 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.5 3.3 3.4 3.3 3.7 3.6 3.4 3.3 3.4 3.2 3.4 3.3 3.3 3.3 3.3 3.3 3.3 3.3 3.4 3.3 3.2
3.4 3.2 3.3 3.3 3.3 3.2 3.3 3.2 3.2 3.2 3.2 3.4 3.4 3.4 3.3 3.5 3.3 3.3 3.2 3.5 3.1 3.3 3.3 3.4 3.2 3.4 3.3 3.3 3.3 3.3 3.3 3.4 3.4 3.4 3.4 3.2
3.5 3.5 3.4 3.4 3.4 3.3 3.3 3.2 3.2 3.2 3.3 4.1 3.6 3.5 3.3 3.4 3.4 3.2 3.1 3.8 3.5 3.4 3.3 3.4 3.3 3.4 3.3 3.3 3.4 3.4 3.5 3.6 3.5 3.4 3.5 3.3
3.4 3.6 3.5 3.7 3.4 3.4 3.3 3.3 3.2 3.3 3.6 5.2 3.6 3.2 3.2 3.4 3.6 3.2 3.3 4.0 4.3 3.6 3.4 3.4 3.4 3.4 3.4 3.3 3.5 3.8 4.3 4.0 3.8 3.6 3.7 3.3
3.3 3.5 3.4 3.6 3.4 3.4 3.4 3.5 3.3 3.3 3.7 4.4 3.5 3.4 3.5 3.7 3.8 3.5 3.8 3.8 3.9 3.5 3.2 3.5 3.6 3.5 3.2 3.2 3.4 3.8 3.9 3.8 4.0 3.8 3.6 3.2
3.3 3.3 3.1 3.0 3.2 3.3 3.2 3.2 3.2 3.2 3.4 3.8 3.4 3.3 3.4 3.5 3.7 3.6 3.7 3.9 3.9 3.7 3.5 3.6 3.6 3.4 3.3 3.4 3.4 3.4 3.3 3.2 3.5 3.6 3.4 3.3
3.1 3.0 3.0 3.2 3.2 3.1 3.0 2.7 2.6 2.7 2.6 2.8 3.1 3.0 2.8 2.7 2.9 2.9 2.6 2.4 2.5 2.7 2.7 2.3 2.3 2.7 2.7 2.8 2.8 2.9 2.8 2.8 2.9 2.9 2.8 2.9
2.7 2.6 2.5 2.5 2.3 2.2 2.1 2.0 1.9 2.0 2.0 2.1 2.2 2.2 2.0 1.9 1.9 1.9 1.9 1.8 1.8 2.0 2.4 2.5 2.1 1.9 2.4 2.8 2.9 2.6 2.7 3.0 2.6 2.3 2.3 2.5
2.0 2.0 2.0 1.8 2.1 2.2 1.9 1.6 1.8 1.8 1.7 1.9 1.8 1.8 1.7 1.8 2.0 2.0 2.0 2.2 2.5 2.3 2.0 1.7 2.1 2.1 1.6 1.4 1.5 1.8 2.0 1.9 2.0 2.1 2.2 2.0
2.2 2.1 2.1 1.9 1.8 1.7 1.5 1.3 1.3 1.4 1.7 1.9 1.9 1.9 1.7 1.5 1.6 1.6 1.6 1.6 1.6 1.7 1.8 1.8 1.9 1.8 1.8 1.7 1.6 1.6 1.5 1.4 1.3 1.5 2.1 2.2

Figure 30. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



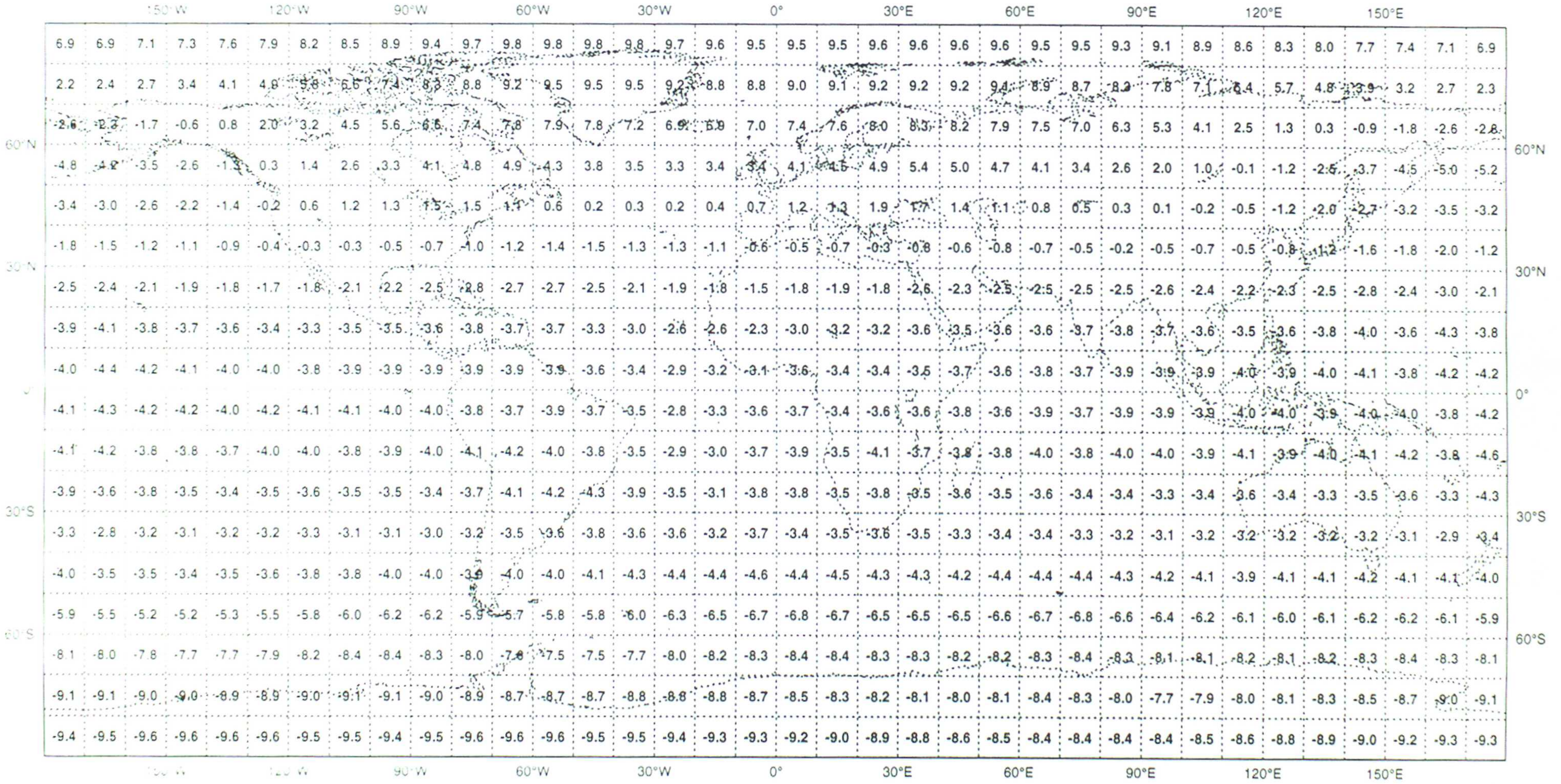
7.7	7.7	7.9	8.0	8.1	8.2	8.1	8.2	8.6	9.5	10.2	9.0	9.4	9.5	9.5	8.0	7.1	6.8	6.4	6.2	6.6	6.9	7.1	7.4	8.3	9.1	9.4	9.5	9.5	9.4	9.2	9.1	8.6	8.3	8.1	7.9
6.7	6.3	5.9	5.9	6.1	6.4	7.8	7.5	7.7	8.3	7.8	7.6	9.1	11.7	12.0	7.8	4.2	3.9	3.7	4.0	4.5	5.1	5.7	6.8	7.9	8.6	9.5	10.0	10.4	10.3	10.4	10.0	9.2	8.7	8.1	7.4
5.1	4.3	4.5	4.6	4.4	4.4	4.8	6.2	6.9	6.9	6.7	5.3	4.7	7.6	4.9	3.4	2.7	2.7	2.7	2.9	3.7	5.6	6.9	7.9	8.5	9.3	10.5	12.0	12.4	12.9	14.0	14.8	13.1	10.8	8.5	6.6
1.6	1.8	1.4	0.8	1.6	2.6	1.8	3.3	4.5	5.1	5.8	5.8	3.9	2.9	1.5	0.8	0.7	0.3	0.9	1.1	2.7	5.0	6.0	7.4	7.4	7.2	7.6	8.8	9.2	11.8	12.3	12.5	5.8	4.3	3.6	2.2
0.6	0.3	0.6	0.1	0.1	1.1	1.3	0.7	0.7	1.5	2.4	1.5	1.0	-0.1	-0.9	-0.8	-0.3	-0.1	0.2	0.6	2.1	2.4	2.9	3.0	3.4	4.4	4.8	5.5	5.0	5.7	5.9	6.3	2.8	2.0	1.4	1.4
-1.9	-2.1	-1.6	-1.8	-2.1	-2.1	-2.3	-2.4	-3.7	-2.9	-3.2	-3.4	-3.2	-3.1	-2.7	-3.0	-3.9	-3.9	-3.8	-3.6	-1.7	-2.1	-1.2	-1.4	-1.1	1.8	3.6	1.9	-0.7	-0.1	-1.0	-1.2	-1.4	-2.0	-2.9	-2.1
-9.2	-9.6	-8.8	-8.7	-7.9	-8.1	-8.9	-8.2	-7.5	-6.8	-7.6	-9.6	-10.1	-8.9	-8.1	-7.3	-7.2	-8.5	-8.8	-8.8	-8.4	-9.2	-6.6	-7.4	-9.3	-10.0	-9.1	-8.1	-7.0	-5.2	-5.1	-5.4	-6.3	-7.1	-7.9	-7.8
-13.4	-13.7	-12.9	-12.4	-10.9	-8.8	-7.9	-8.2	-9.7	-9.4	-10.7	-13.0	-14.8	-14.0	-11.5	-9.5	-8.5	-7.6	-9.3	-10.7	-10.1	-10.2	-10.1	-11.8	-12.0	-11.6	-11.4	-9.4	-7.7	-6.8	-7.9	-9.5	-11.1	-11.4	-12.5	-12.9
-5.9	-5.6	-5.9	-6.4	-6.1	-6.6	-7.3	-8.7	-9.6	-7.4	-6.1	-7.2	-7.7	-5.9	-4.5	-4.5	-5.6	-5.9	-6.4	-6.2	-5.6	-5.3	-6.8	-6.2	-6.7	-6.0	-4.2	-3.8	-4.8	-6.2	-6.3	-7.4	-7.1	-6.9	-7.5	-7.4
-3.4	-4.6	-6.5	-8.7	-10.8	-13.1	-13.7	-13.1	-12.0	-8.2	-3.2	-2.8	-5.7	-6.4	-6.8	-6.4	-7.4	-7.3	-5.7	-2.6	-2.9	-4.6	-5.4	-4.1	-3.9	-3.8	-3.9	-4.0	-4.1	-4.9	-5.4	-5.5	-5.3	-5.4	-5.2	-4.3
-7.8	-8.1	-5.8	-5.6	-8.6	-12.6	-14.5	-14.9	-15.1	-14.3	-9.5	-5.9	-5.7	-5.9	-6.1	-6.2	-8.6	-10.0	-10.0	-6.6	-5.6	-5.8	-5.3	-4.8	-5.7	-7.4	-9.6	-10.2	-9.6	-9.3	-7.4	-7.6	-7.8	-8.4	-8.2	-8.9
-8.2	-8.6	-8.4	-7.0	-5.2	-5.2	-6.9	-8.8	-10.3	-11.7	-13.5	-9.4	-8.3	-7.7	-6.3	-4.5	-5.5	-9.4	-11.5	-11.4	-7.4	-6.8	-7.4	-5.9	-6.4	-6.5	-7.9	-8.9	-10.4	-9.8	-6.1	-7.1	-8.8	-8.5	-7.7	-8.2
-5.4	-4.4	-4.5	-4.3	-5.4	-4.3	-2.9	-3.4	-4.3	-4.4	-6.5	-5.0	-5.2	-5.4	-5.1	-3.9	-2.4	-4.1	-6.0	-7.4	-6.9	-6.3	-5.9	-6.0	-5.3	-4.0	-3.6	-4.7	-5.8	-6.1	-5.5	-5.5	-6.1	-6.2	-5.7	-5.3
-2.1	-1.7	-2.0	-1.5	-2.0	-2.2	-2.1	-1.4	-1.2	-1.2	-1.3	-2.6	-2.8	-2.2	-2.1	-2.0	-1.7	-1.7	-1.1	-1.7	-1.7	-1.3	-1.0	-0.9	-0.7	-1.1	-0.9	-1.1	-1.5	-1.3	-1.7	-1.7	-2.0	-1.6	-1.2	-1.1
0.1	0.1	0.1	0.0	0.1	0.5	0.6	0.7	0.9	1.0	1.2	1.0	0.3	0.2	0.5	0.9	1.1	1.5	1.3	1.0	1.0	1.2	1.3	1.4	1.4	1.4	1.2	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.4	0.6
1.7	1.6	1.6	1.7	1.7	1.7	1.5	1.5	1.6	1.8	1.7	2.8	1.5	1.4	1.7	1.7	2.2	2.7	2.7	2.5	2.4	2.5	3.4	4.1	3.3	2.7	3.5	3.9	3.8	3.0	3.2	3.5	2.5	2.0	1.9	2.1
2.8	2.6	2.7	3.1	3.9	4.2	3.5	2.9	3.6	3.7	3.1	3.4	2.2	2.4	2.3	2.7	4.8	7.6	9.3	10.3	10.5	11.4	12.4	11.9	8.8	9.7	13.5	16.1	15.5	14.4	13.8	12.5	10.6	8.5	4.5	3.1
4.9	4.4	4.3	4.5	5.0	5.6	6.6	7.8	8.0	7.0	5.6	4.9	5.1	5.4	6.0	7.0	8.2	9.2	9.8	10.3	10.8	11.9	13.1	14.0	14.9	15.4	15.7	15.6	15.0	14.2	13.1	12.1	10.8	9.1	6.4	5.5

Figure 31. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA15, using all observations



2.4	2.3	2.2	2.2	2.2	2.2	2.3	2.4	2.6	2.8	3.3	3.2	3.6	4.1	4.3	4.1	4.0	3.8	3.6	3.6	3.5	3.3	3.2	3.2	3.3	3.3	3.4	3.5	3.6	3.5	3.3	3.1	2.8	2.5	2.4	2.4
2.5	2.6	2.5	2.5	2.7	2.6	2.5	2.7	2.9	3.2	3.2	3.4	4.6	4.1	4.3	5.0	3.7	3.4	3.1	3.1	3.2	2.9	2.6	2.5	2.6	2.8	3.1	3.2	3.3	3.3	3.4	3.1	2.7	2.4	2.4	2.5
3.0	2.7	2.8	3.0	3.3	3.2	3.3	3.5	4.0	3.9	3.4	2.9	3.0	3.9	3.6	3.2	3.1	3.3	3.2	3.5	3.8	3.1	3.0	3.1	3.0	3.1	3.7	4.4	4.1	3.9	3.5	3.7	3.6	3.2	2.9	3.8
2.6	2.8	2.7	3.3	3.3	3.0	3.0	3.1	3.5	3.4	3.2	3.1	2.8	3.3	3.6	3.4	3.5	3.3	3.5	2.1	2.9	3.0	3.3	3.3	3.3	3.3	3.6	3.7	3.9	3.7	3.5	3.8	3.0	2.6	2.7	2.7
2.8	3.1	3.1	3.4	3.5	3.4	3.3	3.5	3.6	3.5	3.7	3.5	3.5	3.7	4.1	3.7	3.3	3.3	3.7	3.2	2.7	3.2	3.7	3.5	3.1	3.0	3.5	3.8	4.0	3.9	3.7	4.6	2.9	2.7	2.7	2.6
3.6	3.8	3.9	3.9	3.9	4.1	4.6	4.6	5.3	4.8	4.3	4.4	4.3	4.1	4.1	4.4	4.4	4.7	4.5	4.6	4.1	4.1	4.3	3.9	4.0	5.7	3.6	3.2	3.9	4.0	3.9	3.8	4.1	4.5	4.5	4.6
5.3	5.4	5.1	5.2	4.4	4.8	5.2	5.6	5.3	4.9	4.5	4.7	4.3	4.1	4.4	5.1	5.3	5.6	4.9	4.9	4.5	4.2	3.7	4.2	4.2	4.3	5.2	4.9	4.3	4.4	4.3	4.4	4.6	4.6	4.6	4.7
4.6	4.4	4.4	5.2	5.8	5.8	6.1	5.4	4.0	3.5	4.2	3.9	3.2	3.3	4.4	5.7	6.5	6.2	4.9	4.2	3.6	3.9	3.2	3.6	3.7	4.0	4.5	5.0	3.9	3.8	4.0	4.6	4.7	4.5	4.8	5.2
4.6	3.7	3.6	4.1	3.7	3.8	3.7	3.5	3.0	3.3	3.7	4.0	4.4	4.5	4.0	4.7	4.1	3.5	3.4	4.0	3.6	2.9	3.3	4.0	4.2	4.0	3.4	2.4	2.8	3.6	3.5	3.9	4.3	4.4	4.8	5.2
2.0	2.3	3.3	3.4	3.1	2.8	2.8	2.6	2.8	3.3	2.3	2.1	3.3	3.6	3.2	3.7	3.2	2.9	3.1	2.6	2.7	3.3	2.9	2.8	2.7	3.0	2.9	2.8	2.9	3.3	3.2	3.5	3.7	3.5	3.0	2.6
4.5	4.9	4.1	3.9	5.1	3.6	2.9	2.9	2.7	3.7	5.6	3.9	3.2	4.0	3.9	3.5	3.5	3.5	4.1	4.6	3.6	3.8	3.6	3.3	3.5	3.7	3.6	3.9	3.7	3.4	3.2	3.9	4.1	4.5	4.1	4.9
4.1	5.1	5.6	5.8	5.2	4.7	4.2	4.2	4.1	4.1	4.2	4.8	4.8	5.2	5.6	4.4	4.3	3.8	3.7	4.3	4.7	4.2	4.2	4.9	5.0	4.4	4.4	4.1	4.4	4.4	4.7	4.8	4.8	4.5	4.4	4.7
4.5	4.4	4.3	4.5	5.1	5.0	4.3	4.0	4.4	4.1	5.0	4.7	4.5	4.6	4.6	4.3	3.9	4.4	4.5	4.6	4.0	4.1	4.1	4.3	4.3	3.9	4.0	4.4	4.3	4.2	4.4	4.4	4.8	4.7	4.2	4.0
3.7	3.7	4.0	3.7	4.0	4.1	3.8	3.7	3.6	3.7	4.2	4.2	4.0	3.7	3.9	4.0	3.6	3.4	3.7	3.8	3.9	3.8	3.6	3.4	3.5	3.6	3.5	3.6	3.5	3.3	3.2	3.5	4.1	3.9	3.5	3.2
3.0	3.2	3.4	3.2	3.2	3.0	2.8	2.7	2.8	2.8	2.8	2.9	3.0	3.0	3.2	3.2	3.1	3.1	3.1	3.0	3.1	2.9	3.0	2.7	2.5	2.7	2.9	2.7	2.9	2.7	2.8	2.9	2.8	2.9	3.3	3.1
2.9	2.7	2.7	2.7	2.6	2.5	2.5	2.4	2.5	2.5	2.6	2.4	2.7	2.7	2.6	2.4	2.4	2.3	2.3	2.4	2.3	2.4	2.7	3.1	2.7	2.4	3.1	3.8	3.8	3.2	3.4	3.6	3.0	2.5	2.5	2.6
2.1	2.2	2.3	2.3	2.5	2.7	2.5	2.5	2.5	2.3	2.0	2.1	2.1	2.1	2.3	2.8	3.2	3.5	3.7	4.1	4.8	4.5	3.9	3.3	4.1	4.0	3.2	3.0	3.2	3.6	3.7	3.1	3.2	2.9	2.7	2.1
3.8	3.4	3.2	3.1	3.0	2.9	2.6	2.3	2.2	2.4	3.1	3.5	3.5	3.4	3.3	3.0	3.0	3.0	2.9	2.7	2.7	3.0	3.4	3.5	3.6	3.6	3.3	2.9	2.6	2.3	2.2	2.0	2.0	2.7	3.8	4.0

Figure 32. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS4 (400 hPa)
NOAA15, using all observations



6.9	6.9	7.1	7.3	7.6	7.9	8.2	8.5	8.9	9.4	9.7	9.8	9.8	9.8	9.8	9.7	9.6	9.5	9.5	9.5	9.6	9.6	9.6	9.6	9.5	9.5	9.3	9.1	8.9	8.6	8.3	8.0	7.7	7.4	7.1	6.9
2.2	2.4	2.7	3.4	4.1	4.8	5.8	6.6	7.4	8.3	8.8	9.2	9.5	9.5	9.5	9.2	8.8	8.8	9.0	9.1	9.2	9.2	9.2	9.4	8.9	8.7	8.2	7.8	7.1	6.4	5.7	4.8	3.9	3.2	2.7	2.3
-2.6	-2.3	-1.7	-0.6	0.8	2.0	3.2	4.5	5.6	6.6	7.4	7.8	7.9	7.8	7.2	6.9	6.9	7.0	7.4	7.6	8.0	8.3	8.2	7.9	7.5	7.0	6.3	5.3	4.1	2.5	1.3	0.3	-0.9	-1.8	-2.6	-2.8
-4.8	-4.2	-3.5	-2.6	-1.3	0.3	1.4	2.6	3.3	4.1	4.8	4.9	4.3	3.8	3.5	3.3	3.4	3.4	4.1	4.5	4.9	5.4	5.0	4.7	4.1	3.4	2.6	2.0	1.0	-0.1	-1.2	-2.5	-3.7	-4.5	-5.0	-5.2
-3.4	-3.0	-2.6	-2.2	-1.4	-0.2	0.6	1.2	1.3	1.5	1.5	1.1	0.6	0.2	0.3	0.2	0.4	0.7	1.2	1.3	1.9	1.7	1.4	1.1	0.8	0.5	0.3	0.1	-0.2	-0.5	-1.2	-2.0	-2.7	-3.2	-3.5	-3.2
-1.8	-1.5	-1.2	-1.1	-0.9	-0.4	-0.3	-0.3	-0.5	-0.7	-1.0	-1.2	-1.4	-1.5	-1.3	-1.3	-1.1	-0.6	-0.5	-0.7	-0.3	-0.8	-0.6	-0.8	-0.7	-0.5	-0.2	-0.5	-0.7	-0.5	-0.8	-1.2	-1.6	-1.8	-2.0	-1.2
-2.5	-2.4	-2.1	-1.9	-1.8	-1.7	-1.8	-2.1	-2.2	-2.5	-2.8	-2.7	-2.7	-2.5	-2.1	-1.9	-1.8	-1.5	-1.8	-1.9	-1.8	-2.6	-2.3	-2.5	-2.5	-2.5	-2.5	-2.6	-2.4	-2.2	-2.3	-2.5	-2.8	-2.4	-3.0	-2.1
-3.9	-4.1	-3.8	-3.7	-3.6	-3.4	-3.3	-3.5	-3.5	-3.6	-3.8	-3.7	-3.7	-3.3	-3.0	-2.6	-2.6	-2.3	-3.0	-3.2	-3.2	-3.6	-3.5	-3.6	-3.6	-3.7	-3.8	-3.7	-3.6	-3.5	-3.6	-3.8	-4.0	-3.6	-4.3	-3.8
-4.0	-4.4	-4.2	-4.1	-4.0	-4.0	-3.8	-3.9	-3.9	-3.9	-3.9	-3.9	-3.9	-3.6	-3.4	-2.9	-3.2	-3.1	-3.6	-3.4	-3.4	-3.5	-3.7	-3.6	-3.8	-3.7	-3.9	-3.9	-3.9	-4.0	-3.9	-4.0	-4.1	-3.8	-4.2	-4.2
-4.1	-4.3	-4.2	-4.2	-4.0	-4.2	-4.1	-4.1	-4.0	-4.0	-3.8	-3.7	-3.9	-3.7	-3.5	-2.8	-3.3	-3.6	-3.7	-3.4	-3.6	-3.6	-3.8	-3.6	-3.9	-3.7	-3.9	-3.9	-3.9	-4.0	-4.0	-3.9	-4.0	-4.0	-3.8	-4.2
-4.1	-4.2	-3.8	-3.8	-3.7	-4.0	-4.0	-3.8	-3.9	-4.0	-4.1	-4.2	-4.0	-3.8	-3.5	-2.9	-3.0	-3.7	-3.9	-3.5	-4.1	-3.7	-3.8	-3.8	-4.0	-3.8	-4.0	-4.0	-3.9	-4.1	-3.9	-4.0	-4.1	-4.2	-3.8	-4.6
-3.9	-3.6	-3.8	-3.5	-3.4	-3.5	-3.6	-3.5	-3.5	-3.4	-3.7	-4.1	-4.2	-4.3	-3.9	-3.5	-3.1	-3.8	-3.8	-3.5	-3.8	-3.5	-3.6	-3.5	-3.6	-3.4	-3.4	-3.3	-3.4	-3.6	-3.4	-3.3	-3.5	-3.6	-3.3	-4.3
-3.3	-2.8	-3.2	-3.1	-3.2	-3.2	-3.3	-3.1	-3.1	-3.0	-3.2	-3.5	-3.6	-3.8	-3.6	-3.6	-3.2	-3.7	-3.4	-3.5	-3.6	-3.5	-3.3	-3.4	-3.4	-3.3	-3.2	-3.1	-3.2	-3.2	-3.2	-3.2	-3.2	-3.1	-2.9	-3.4
-4.0	-3.5	-3.5	-3.4	-3.5	-3.6	-3.8	-3.8	-4.0	-4.0	-3.9	-4.0	-4.0	-4.1	-4.3	-4.4	-4.4	-4.6	-4.4	-4.5	-4.3	-4.3	-4.2	-4.4	-4.4	-4.4	-4.3	-4.2	-4.1	-3.9	-4.1	-4.1	-4.2	-4.1	-4.1	-4.0
-5.9	-5.5	-5.2	-5.2	-5.3	-5.5	-5.8	-6.0	-6.2	-6.2	-5.9	-5.7	-5.8	-5.8	-6.0	-6.3	-6.5	-6.7	-6.8	-6.7	-6.5	-6.5	-6.5	-6.6	-6.7	-6.8	-6.6	-6.4	-6.2	-6.1	-6.0	-6.1	-6.2	-6.2	-6.1	-5.9
-8.1	-8.0	-7.8	-7.7	-7.7	-7.9	-8.2	-8.4	-8.4	-8.3	-8.0	-7.8	-7.5	-7.5	-7.7	-8.0	-8.2	-8.3	-8.4	-8.4	-8.3	-8.3	-8.2	-8.2	-8.3	-8.4	-8.3	-8.1	-8.1	-8.2	-8.1	-8.2	-8.3	-8.4	-8.3	-8.1
-9.1	-9.1	-9.0	-9.0	-8.9	-8.9	-9.0	-9.1	-9.1	-9.0	-8.9	-8.7	-8.7	-8.7	-8.8	-8.8	-8.8	-8.7	-8.5	-8.3	-8.2	-8.1	-8.0	-8.1	-8.4	-8.3	-8.0	-7.7	-7.9	-8.0	-8.1	-8.3	-8.5	-8.7	-9.0	-9.1
-9.4	-9.5	-9.6	-9.6	-9.6	-9.6	-9.5	-9.5	-9.4	-9.5	-9.6	-9.6	-9.6	-9.5	-9.5	-9.4	-9.3	-9.3	-9.2	-9.0	-8.9	-8.8	-8.6	-8.5	-8.4	-8.4	-8.4	-8.4	-8.5	-8.6	-8.8	-8.9	-9.0	-9.2	-9.3	-9.3

Figure 33. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS4 (400 hPa)
NOAA15, using all observations

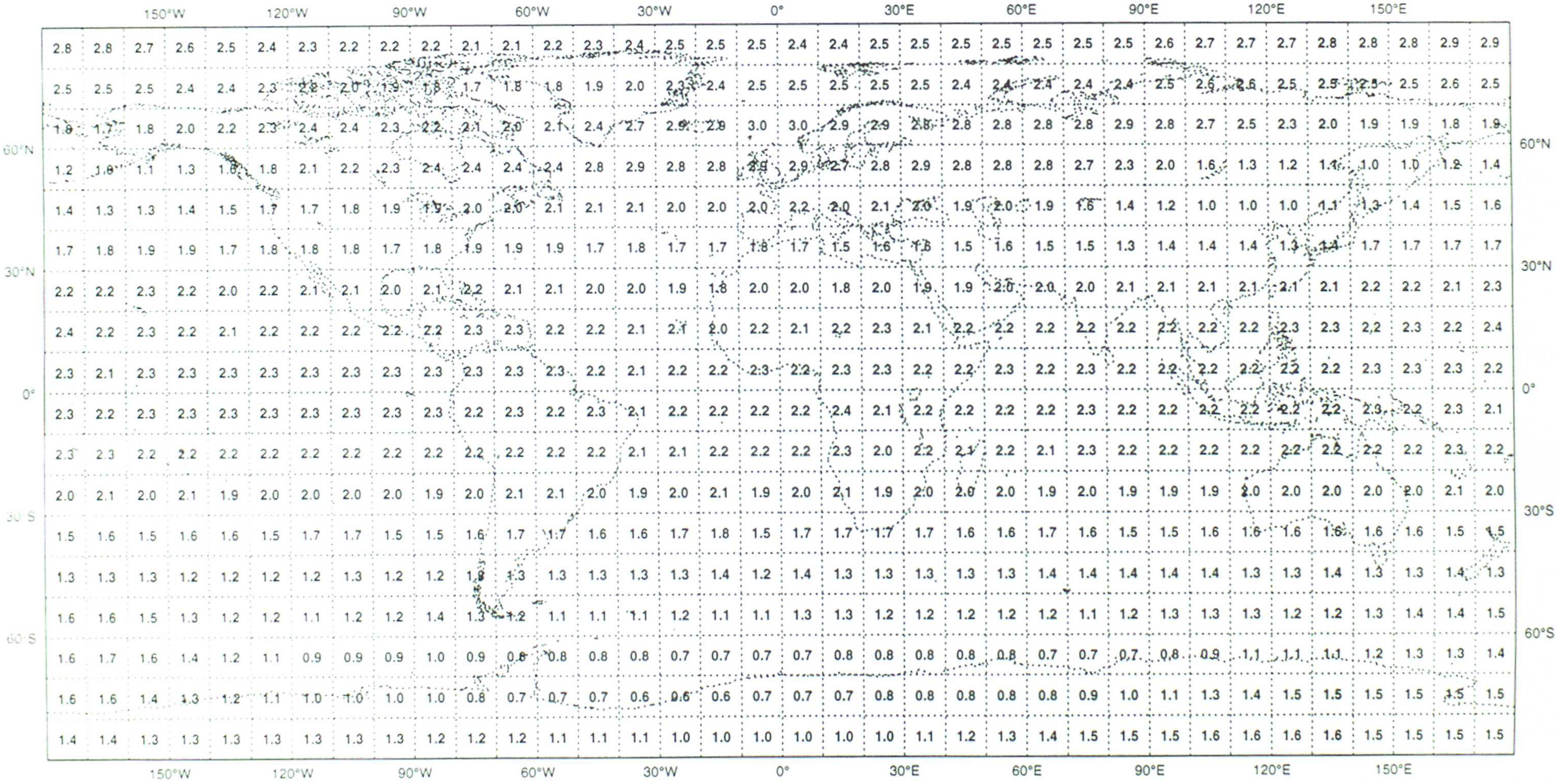
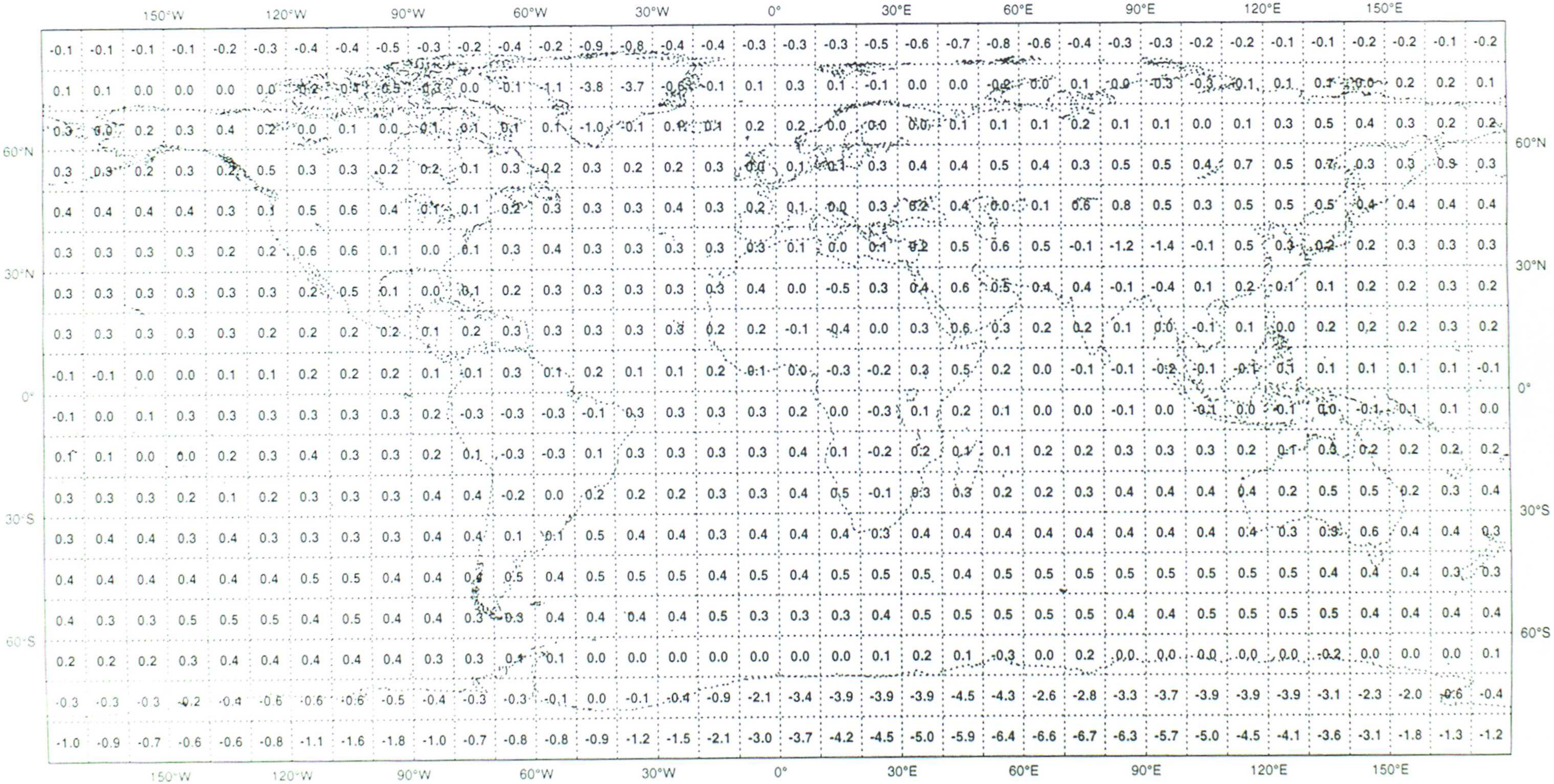

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
2.8 2.8 2.7 2.6 2.5 2.4 2.3 2.2 2.2 2.2 2.1 2.1 2.2 2.3 2.4 2.5 2.5 2.5 2.4 2.4 2.5 2.5 2.5 2.5 2.5 2.5 2.5 2.6 2.7 2.7 2.7 2.8 2.8 2.8 2.9 2.9
2.5 2.5 2.5 2.4 2.4 2.3 2.2 2.0 1.9 1.8 1.7 1.8 1.8 1.9 2.0 2.3 2.4 2.5 2.5 2.5 2.5 2.5 2.4 2.4 2.4 2.4 2.4 2.5 2.6 2.6 2.5 2.5 2.5 2.5 2.6 2.5
1.8 1.7 1.8 2.0 2.2 2.3 2.4 2.4 2.3 2.2 2.1 2.0 2.1 2.4 2.7 2.9 2.9 3.0 3.0 2.9 2.9 2.8 2.8 2.8 2.8 2.8 2.9 2.8 2.7 2.5 2.3 2.0 1.9 1.9 1.8 1.9
1.2 1.8 1.1 1.3 1.6 1.8 2.1 2.2 2.3 2.4 2.4 2.4 2.4 2.8 2.9 2.8 2.8 2.9 2.9 2.7 2.8 2.9 2.8 2.8 2.8 2.7 2.3 2.0 1.6 1.3 1.2 1.1 1.0 1.0 1.2 1.4
1.4 1.3 1.3 1.4 1.5 1.7 1.7 1.8 1.9 1.9 2.0 2.0 2.1 2.1 2.1 2.0 2.0 2.0 2.2 2.0 2.1 2.0 1.9 2.0 1.9 1.6 1.4 1.2 1.0 1.0 1.0 1.1 1.3 1.4 1.5 1.6
1.7 1.8 1.9 1.9 1.7 1.8 1.8 1.8 1.7 1.8 1.9 1.9 1.9 1.7 1.8 1.7 1.7 1.8 1.7 1.5 1.6 1.6 1.5 1.6 1.5 1.5 1.3 1.4 1.4 1.4 1.3 1.4 1.7 1.7 1.7 1.7
2.2 2.2 2.3 2.2 2.0 2.2 2.1 2.1 2.0 2.1 2.2 2.1 2.1 2.0 2.0 1.9 1.8 2.0 2.0 1.8 2.0 1.9 1.9 2.0 2.0 2.0 2.1 2.1 2.1 2.1 2.1 2.1 2.2 2.2 2.1 2.3
2.4 2.2 2.3 2.2 2.1 2.2 2.2 2.2 2.2 2.2 2.3 2.3 2.2 2.2 2.1 2.1 2.0 2.2 2.1 2.2 2.3 2.1 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.3 2.3 2.2 2.3 2.2 2.4
2.3 2.1 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.2 2.1 2.2 2.2 2.3 2.2 2.3 2.3 2.2 2.2 2.3 2.2 2.3 2.2 2.2 2.2 2.2 2.2 2.2 2.3 2.3 2.3 2.2
2.3 2.2 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.3 2.2 2.3 2.2 2.3 2.1 2.2 2.2 2.2 2.2 2.4 2.1 2.2 2.2 2.2 2.2 2.3 2.2 2.2 2.2 2.2 2.2 2.2 2.3 2.2 2.3 2.1
2.3 2.3 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.1 2.1 2.2 2.2 2.2 2.3 2.0 2.2 2.1 2.2 2.1 2.3 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.2 2.3 2.2
2.0 2.1 2.0 2.1 1.9 2.0 2.0 2.0 2.0 1.9 2.0 2.1 2.1 2.0 1.9 2.0 2.1 1.9 2.0 2.1 1.9 2.0 2.0 2.0 1.9 2.0 1.9 1.9 1.9 2.0 2.0 2.0 2.0 2.0 2.1 2.0
1.5 1.6 1.5 1.6 1.6 1.5 1.7 1.7 1.5 1.5 1.6 1.7 1.7 1.6 1.6 1.7 1.8 1.5 1.7 1.7 1.7 1.7 1.6 1.6 1.7 1.6 1.5 1.5 1.6 1.6 1.6 1.6 1.6 1.6 1.5 1.5
1.3 1.3 1.3 1.2 1.2 1.2 1.2 1.3 1.2 1.2 1.8 1.3 1.3 1.3 1.3 1.3 1.4 1.2 1.4 1.3 1.3 1.3 1.3 1.3 1.4 1.4 1.4 1.4 1.4 1.3 1.3 1.4 1.3 1.3 1.4 1.3
1.6 1.6 1.5 1.3 1.2 1.2 1.1 1.2 1.2 1.4 1.3 1.2 1.1 1.1 1.1 1.2 1.1 1.1 1.3 1.3 1.2 1.2 1.2 1.2 1.2 1.1 1.2 1.3 1.3 1.3 1.2 1.2 1.3 1.4 1.4 1.5
1.6 1.7 1.6 1.4 1.2 1.1 0.9 0.9 0.9 1.0 0.9 0.8 0.8 0.8 0.8 0.7 0.7 0.7 0.7 0.8 0.8 0.8 0.8 0.8 0.7 0.7 0.7 0.8 0.9 1.1 1.1 1.1 1.2 1.3 1.3 1.4
1.6 1.6 1.4 1.3 1.2 1.1 1.0 1.0 1.0 1.0 0.8 0.7 0.7 0.7 0.6 0.6 0.6 0.7 0.7 0.7 0.8 0.8 0.8 0.8 0.8 0.9 1.0 1.1 1.3 1.4 1.5 1.5 1.5 1.5 1.5 1.5
1.4 1.4 1.3 1.3 1.3 1.3 1.3 1.3 1.3 1.2 1.2 1.2 1.1 1.1 1.1 1.0 1.0 1.0 1.0 1.0 1.0 1.1 1.2 1.3 1.4 1.5 1.5 1.5 1.6 1.6 1.6 1.6 1.5 1.5 1.5 1.5

Figure 34. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations



-0.1	-0.1	-0.1	-0.1	-0.2	-0.3	-0.4	-0.4	-0.5	-0.3	-0.2	-0.4	-0.2	-0.9	-0.8	-0.4	-0.4	-0.3	-0.3	-0.3	-0.5	-0.6	-0.7	-0.8	-0.6	-0.4	-0.3	-0.3	-0.2	-0.2	-0.1	-0.1	-0.2	-0.2	-0.1	-0.2
0.1	0.1	0.0	0.0	0.0	0.0	-0.2	-0.4	-0.5	-0.3	0.0	-0.1	-1.1	-3.8	-3.7	-0.6	-0.1	0.1	0.3	0.1	-0.1	0.0	0.0	-0.2	0.0	0.1	0.0	-0.3	-0.3	-0.1	0.1	0.1	0.0	0.2	0.2	0.1
0.3	0.0	0.2	0.3	0.4	0.2	0.0	0.1	0.0	0.1	0.1	0.1	0.1	-1.0	-0.1	0.1	0.1	0.2	0.2	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.0	0.1	0.3	0.5	0.4	0.3	0.2	0.2
0.3	0.3	0.2	0.3	0.2	0.5	0.3	0.3	0.2	0.2	0.1	0.3	-0.2	0.3	0.2	0.2	0.3	0.0	0.1	0.1	0.3	0.4	0.4	0.5	0.4	0.3	0.5	0.5	0.4	0.7	0.5	0.7	0.3	0.3	0.3	0.3
0.4	0.4	0.4	0.4	0.3	0.1	0.5	0.6	0.4	0.1	0.1	0.2	0.3	0.3	0.3	0.4	0.3	0.2	0.1	0.0	0.3	0.2	0.4	0.0	0.1	0.6	0.8	0.5	0.3	0.5	0.5	0.5	0.4	0.4	0.4	0.4
0.3	0.3	0.3	0.3	0.2	0.2	0.6	0.6	0.1	0.0	0.1	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.1	0.0	0.1	0.2	0.5	0.6	0.5	-0.1	-1.2	-1.4	-0.1	0.5	0.3	0.2	0.2	0.3	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.5	0.1	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.0	-0.5	0.3	0.4	0.6	0.5	0.4	0.4	-0.1	-0.4	0.1	0.2	0.1	0.1	0.2	0.2	0.3	0.2
0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.2	0.2	-0.1	-0.4	0.0	0.3	0.6	0.3	0.2	0.2	0.1	0.0	-0.1	0.1	0.0	0.2	0.2	0.2	0.3	0.2
-0.1	-0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1	-0.1	0.3	0.1	0.2	0.1	0.1	0.2	0.1	0.0	-0.3	-0.2	0.3	0.5	0.2	0.0	-0.1	-0.1	-0.2	-0.1	-0.1	0.1	0.1	0.1	0.1	0.1	-0.1
-0.1	0.0	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.2	-0.3	-0.3	-0.3	-0.1	0.3	0.3	0.3	0.3	0.2	0.0	-0.3	0.1	0.2	0.1	0.0	0.0	-0.1	0.0	-0.1	0.0	-0.1	0.0	-0.1	-0.1	0.1	0.0
0.1	0.1	0.0	0.0	0.2	0.3	0.4	0.3	0.3	0.2	0.1	-0.3	-0.3	0.1	0.3	0.3	0.3	0.3	0.4	0.1	-0.2	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.2	0.1	0.3	0.2	0.2	0.2	0.2
0.3	0.3	0.3	0.2	0.1	0.2	0.3	0.3	0.3	0.4	0.4	-0.2	0.0	0.2	0.2	0.2	0.3	0.3	0.4	0.5	-0.1	0.3	0.3	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.2	0.5	0.5	0.2	0.3	0.4
0.3	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.1	0.1	0.5	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.6	0.4	0.4	0.3
0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3
0.4	0.3	0.3	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.1	-0.3	0.0	0.2	0.0	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	0.1
-0.3	-0.3	-0.3	-0.2	-0.4	-0.6	-0.6	-0.6	-0.5	-0.4	-0.3	-0.3	-0.1	0.0	-0.1	-0.4	-0.9	-2.1	-3.4	-3.9	-3.9	-3.9	-4.5	-4.3	-2.6	-2.8	-3.3	-3.7	-3.9	-3.9	-3.9	-3.1	-2.3	-2.0	-0.6	-0.4
-1.0	-0.9	-0.7	-0.6	-0.6	-0.8	-1.1	-1.6	-1.8	-1.0	-0.7	-0.8	-0.8	-0.9	-1.2	-1.5	-2.1	-3.0	-3.7	-4.2	-4.5	-5.0	-5.9	-6.4	-6.6	-6.7	-6.3	-5.7	-5.0	-4.5	-4.1	-3.6	-3.1	-1.8	-1.3	-1.2

Figure 35. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-5 (700 hPa)
NOAA15, using all observations

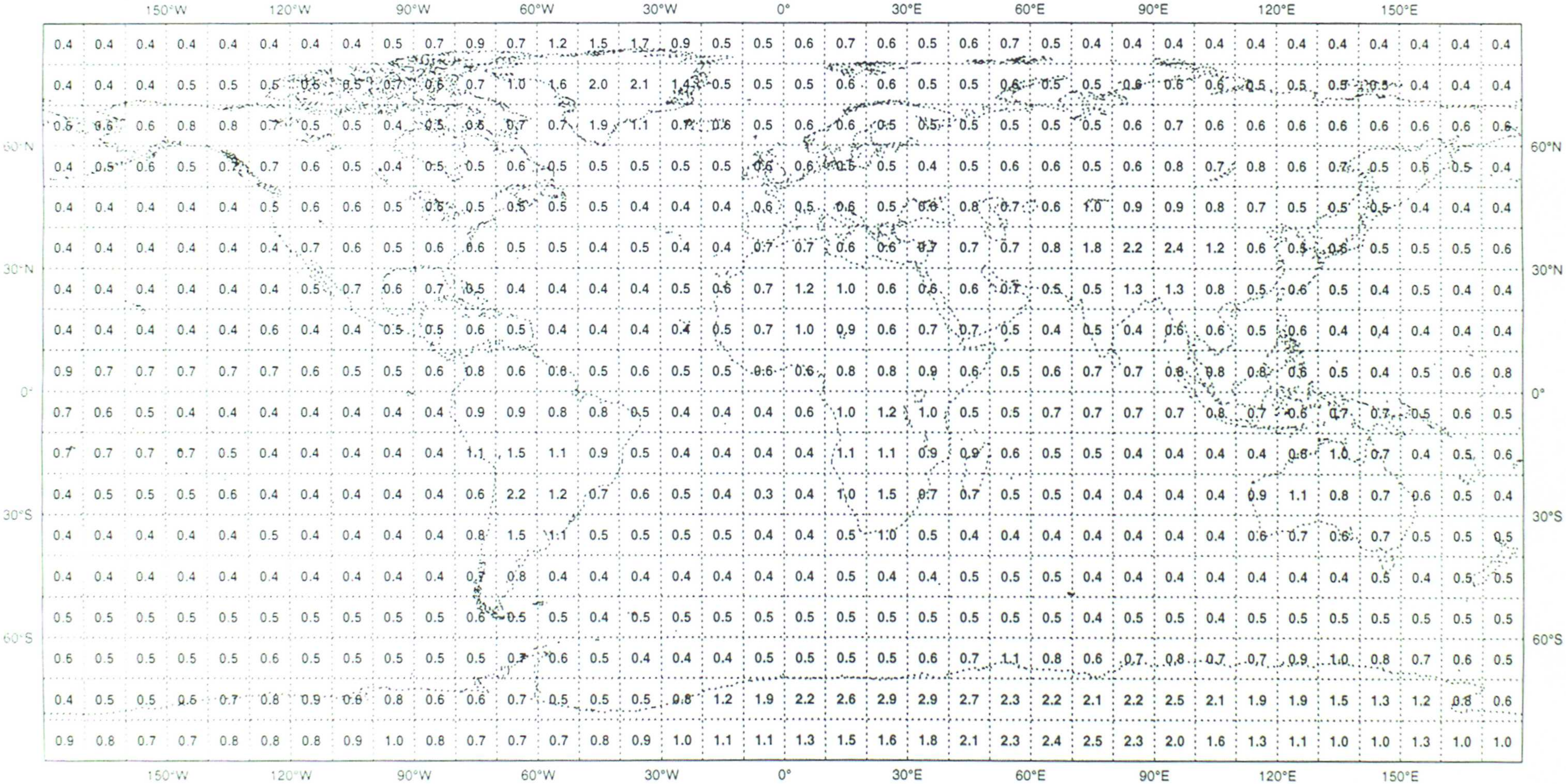
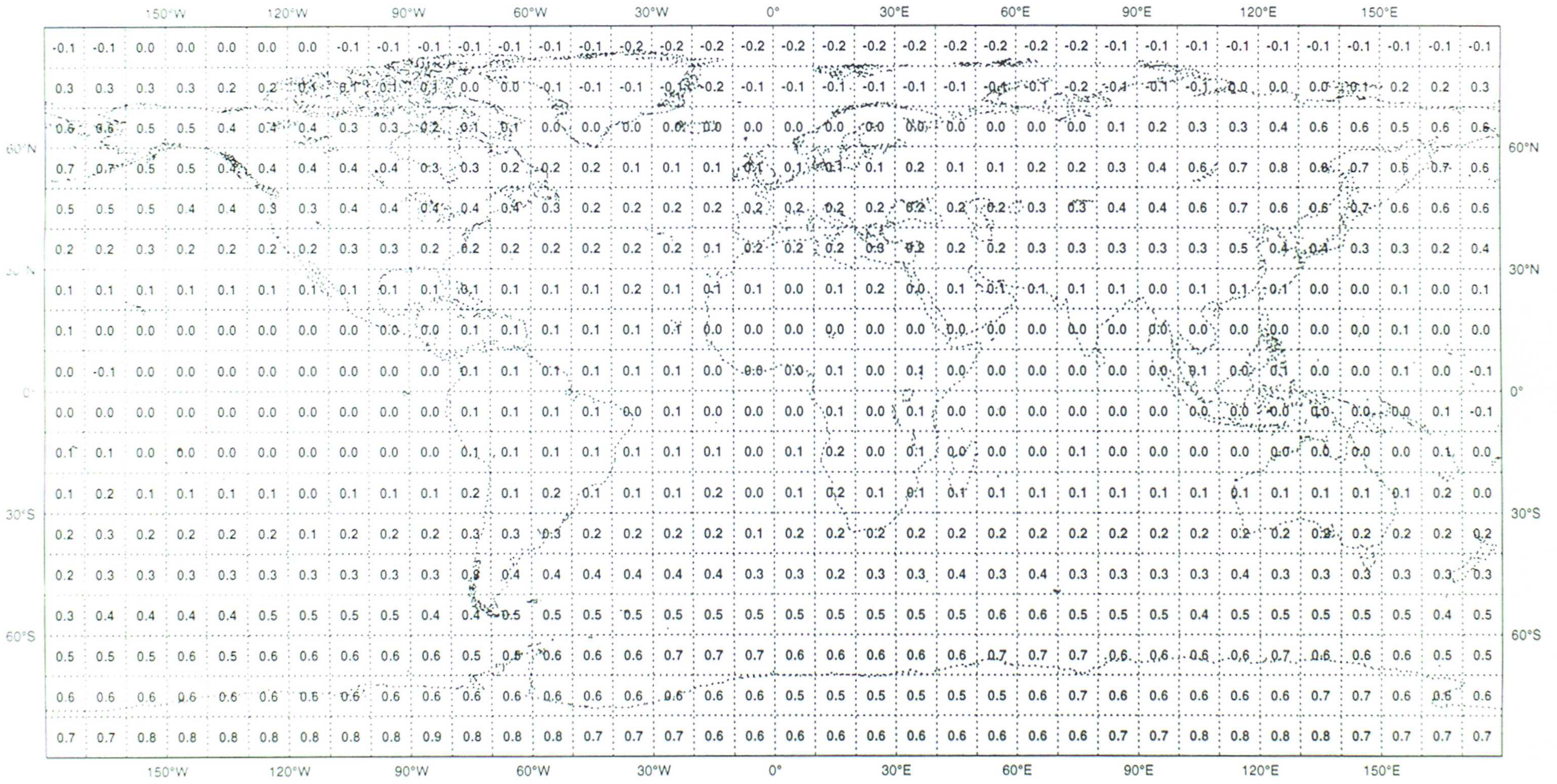

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.7 0.9 0.7 1.2 1.5 1.7 0.9 0.5 0.5 0.6 0.7 0.6 0.5 0.6 0.7 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4
0.4 0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.7 0.6 0.7 1.0 1.6 2.0 2.1 1.4 0.5 0.5 0.5 0.6 0.6 0.5 0.5 0.6 0.5 0.5 0.6 0.6 0.6 0.5 0.5 0.5 0.5 0.4 0.4 0.4
0.6 0.6 0.6 0.8 0.8 0.7 0.5 0.5 0.4 0.5 0.6 0.7 0.7 1.9 1.1 0.7 0.6 0.5 0.6 0.6 0.5 0.5 0.5 0.5 0.5 0.5 0.6 0.7 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6
0.4 0.5 0.6 0.5 0.7 0.7 0.6 0.5 0.4 0.5 0.5 0.6 0.5 0.5 0.5 0.5 0.5 0.6 0.6 0.5 0.5 0.4 0.5 0.6 0.6 0.5 0.6 0.8 0.7 0.8 0.6 0.7 0.5 0.6 0.5 0.4
0.4 0.4 0.4 0.4 0.4 0.5 0.6 0.6 0.5 0.6 0.5 0.5 0.5 0.5 0.4 0.4 0.4 0.6 0.5 0.6 0.5 0.6 0.8 0.7 0.6 1.0 0.9 0.9 0.8 0.7 0.5 0.5 0.5 0.4 0.4 0.4
0.4 0.4 0.4 0.4 0.4 0.4 0.7 0.6 0.5 0.6 0.6 0.5 0.5 0.4 0.5 0.4 0.4 0.7 0.7 0.6 0.6 0.7 0.7 0.7 0.8 1.8 2.2 2.4 1.2 0.6 0.5 0.6 0.5 0.5 0.5 0.6
0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.7 0.6 0.7 0.5 0.4 0.4 0.4 0.4 0.5 0.6 0.7 1.2 1.0 0.6 0.6 0.6 0.7 0.5 0.5 1.3 1.3 0.8 0.5 0.6 0.5 0.4 0.5 0.4 0.4
0.4 0.4 0.4 0.4 0.4 0.6 0.4 0.4 0.5 0.5 0.6 0.5 0.4 0.4 0.4 0.4 0.5 0.7 1.0 0.9 0.6 0.7 0.7 0.5 0.4 0.5 0.4 0.6 0.6 0.5 0.6 0.4 0.4 0.4 0.4 0.4
0.9 0.7 0.7 0.7 0.7 0.7 0.6 0.5 0.5 0.6 0.8 0.6 0.8 0.5 0.6 0.5 0.5 0.6 0.6 0.8 0.8 0.9 0.6 0.5 0.6 0.7 0.7 0.8 0.8 0.8 0.6 0.5 0.4 0.5 0.6 0.8
0.7 0.6 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.9 0.9 0.8 0.8 0.5 0.4 0.4 0.4 0.6 1.0 1.2 1.0 0.5 0.5 0.7 0.7 0.7 0.7 0.8 0.7 0.6 0.7 0.7 0.5 0.6 0.5
0.7 0.7 0.7 0.7 0.5 0.4 0.4 0.4 0.4 0.4 1.1 1.5 1.1 0.9 0.5 0.4 0.4 0.4 0.4 1.1 1.1 0.9 0.9 0.6 0.5 0.5 0.4 0.4 0.4 0.4 0.8 1.0 0.7 0.4 0.5 0.6
0.4 0.5 0.5 0.5 0.6 0.4 0.4 0.4 0.4 0.4 0.6 2.2 1.2 0.7 0.6 0.5 0.4 0.3 0.4 1.0 1.5 0.7 0.7 0.5 0.5 0.4 0.4 0.4 0.4 0.9 1.1 0.8 0.7 0.6 0.5 0.4
0.4 0.4 0.4 0.4 0.4 0.5 0.4 0.4 0.4 0.4 0.8 1.5 1.1 0.5 0.5 0.5 0.5 0.4 0.4 0.5 1.0 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.6 0.7 0.6 0.7 0.5 0.5 0.5
0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.7 0.8 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.4 0.4 0.5 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.4 0.5 0.5
0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.6 0.5 0.5 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.5 0.5 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5
0.6 0.5 0.5 0.5 0.5 0.6 0.5 0.5 0.5 0.5 0.5 0.7 0.6 0.5 0.4 0.4 0.4 0.5 0.5 0.5 0.5 0.6 0.7 1.1 0.8 0.6 0.7 0.8 0.7 0.7 0.9 1.0 0.8 0.7 0.6 0.5
0.4 0.5 0.5 0.6 0.7 0.8 0.9 0.6 0.8 0.6 0.6 0.7 0.5 0.5 0.5 0.8 1.2 1.9 2.2 2.6 2.9 2.9 2.7 2.3 2.2 2.1 2.2 2.5 2.1 1.9 1.9 1.5 1.3 1.2 0.8 0.6
0.9 0.8 0.7 0.7 0.8 0.8 0.8 0.9 1.0 0.8 0.7 0.7 0.7 0.8 0.9 1.0 1.1 1.1 1.3 1.5 1.6 1.8 2.1 2.3 2.4 2.5 2.3 2.0 1.6 1.3 1.1 1.0 1.0 1.3 1.0 1.0

Figure 36. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations



-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.4	-0.1	-0.1	0.0	0.0	0.0	-0.1	0.2	0.2	0.3
0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.6	0.6	0.5	0.6	0.6
0.7	0.7	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.2	0.3	0.4	0.6	0.7	0.8	0.8	0.7	0.6	0.7	0.6
0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.6
0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.5	0.4	0.4	0.3	0.3	0.2	0.4
0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.2	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.0	0.0	0.1	0.0	0.1
0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.1	0.0	-0.1
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	-0.1
0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1	0.2	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.1	0.2	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0
0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.5
0.5	0.5	0.5	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.5	0.5
0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.6
0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7

Figure 37. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-7 (300 hPa)
NOAA15, using all observations

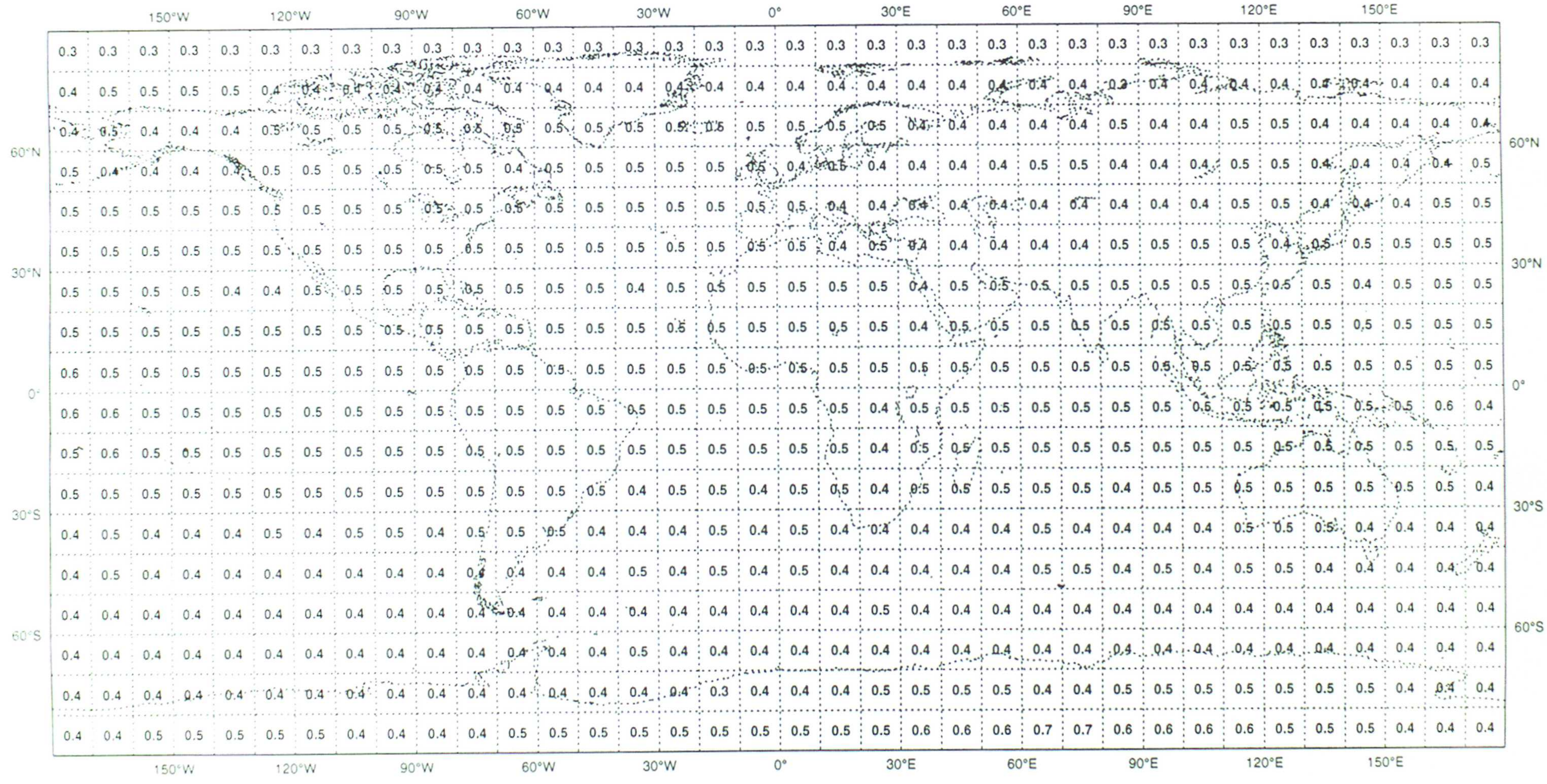
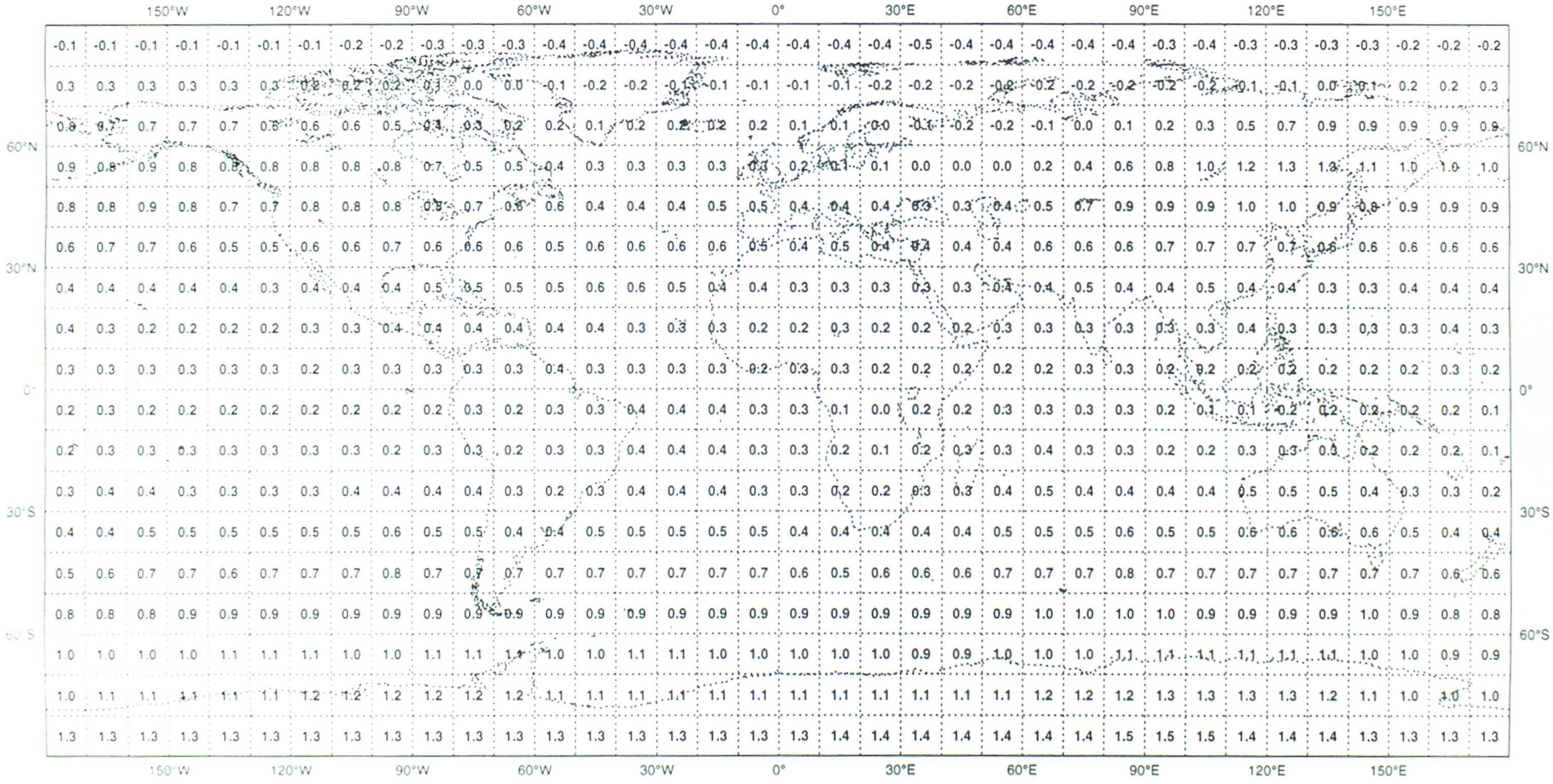

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3
0.4 0.5 0.5 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.3 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4
0.4 0.5 0.4 0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.5 0.4 0.4 0.5 0.5 0.4 0.4 0.4 0.4 0.4
0.5 0.4 0.4 0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.5 0.4 0.4 0.4 0.4 0.5 0.5 0.4 0.4 0.4 0.5 0.5 0.4 0.4 0.4 0.4 0.5
0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.5 0.4 0.4 0.4 0.5 0.5
0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.5 0.4 0.4 0.4 0.4 0.4 0.5 0.5 0.5 0.5 0.4 0.5 0.5 0.5 0.5 0.5
0.5 0.5 0.5 0.5 0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.5 0.5 0.5
0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5
0.6 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5
0.6 0.6 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.6 0.4
0.5 0.6 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5
0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.5 0.5 0.4 0.5 0.5 0.4 0.5 0.5 0.5 0.5 0.5 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4
0.4 0.5 0.4 0.4 0.4 0.5 0.4 0.5 0.5 0.4 0.5 0.5 0.5 0.4 0.4 0.4 0.5 0.4 0.5 0.4 0.4 0.4 0.4 0.4 0.5 0.4 0.4 0.4 0.4 0.5 0.5 0.5 0.4 0.4 0.4 0.4
0.4 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.4 0.5 0.4 0.5 0.4 0.4 0.4 0.4 0.4 0.5 0.5 0.4 0.5 0.4 0.5 0.5 0.4 0.4 0.4 0.4 0.4
0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4
0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4
0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.3 0.4 0.4 0.4 0.5 0.5 0.5 0.5 0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.4 0.4
0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.4 0.4 0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.6 0.6 0.6 0.7 0.7 0.6 0.6 0.6 0.6 0.5 0.5 0.5 0.4 0.4 0.4
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 38. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations



-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.5	-0.4	-0.4	-0.4	-0.4	-0.4	-0.3	-0.4	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2
0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.0	0.0	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	0.0	0.1	0.2	0.2	0.3
0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.0	-0.1	-0.2	-0.2	-0.1	0.0	0.1	0.2	0.3	0.5	0.7	0.9	0.9	0.9	0.9	0.9
0.9	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.2	0.4	0.6	0.8	1.0	1.2	1.3	1.3	1.1	1.0	1.0	1.0
0.8	0.8	0.9	0.8	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.4	0.5	0.7	0.9	0.9	0.9	1.0	1.0	0.9	0.8	0.9	0.9	0.9
0.6	0.7	0.7	0.6	0.5	0.5	0.6	0.6	0.7	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6
0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.4	0.4	0.4
0.4	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2
0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.1	0.0	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1
0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.2	0.1	0.2	0.3	0.3	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.1
0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.3	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.3	0.3	0.2
0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.4	0.4
0.5	0.6	0.7	0.7	0.6	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6
0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	1.0	0.9	0.8	0.8
1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.1	1.1	1.0	1.0	1.0	1.0	1.0	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	0.9	0.9
1.0	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.2	1.1	1.0	1.0	1.0
1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.4	1.4	1.4	1.3	1.3	1.3	1.3

Figure 39. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-9 (100 hPa)
NOAA15, using all observations

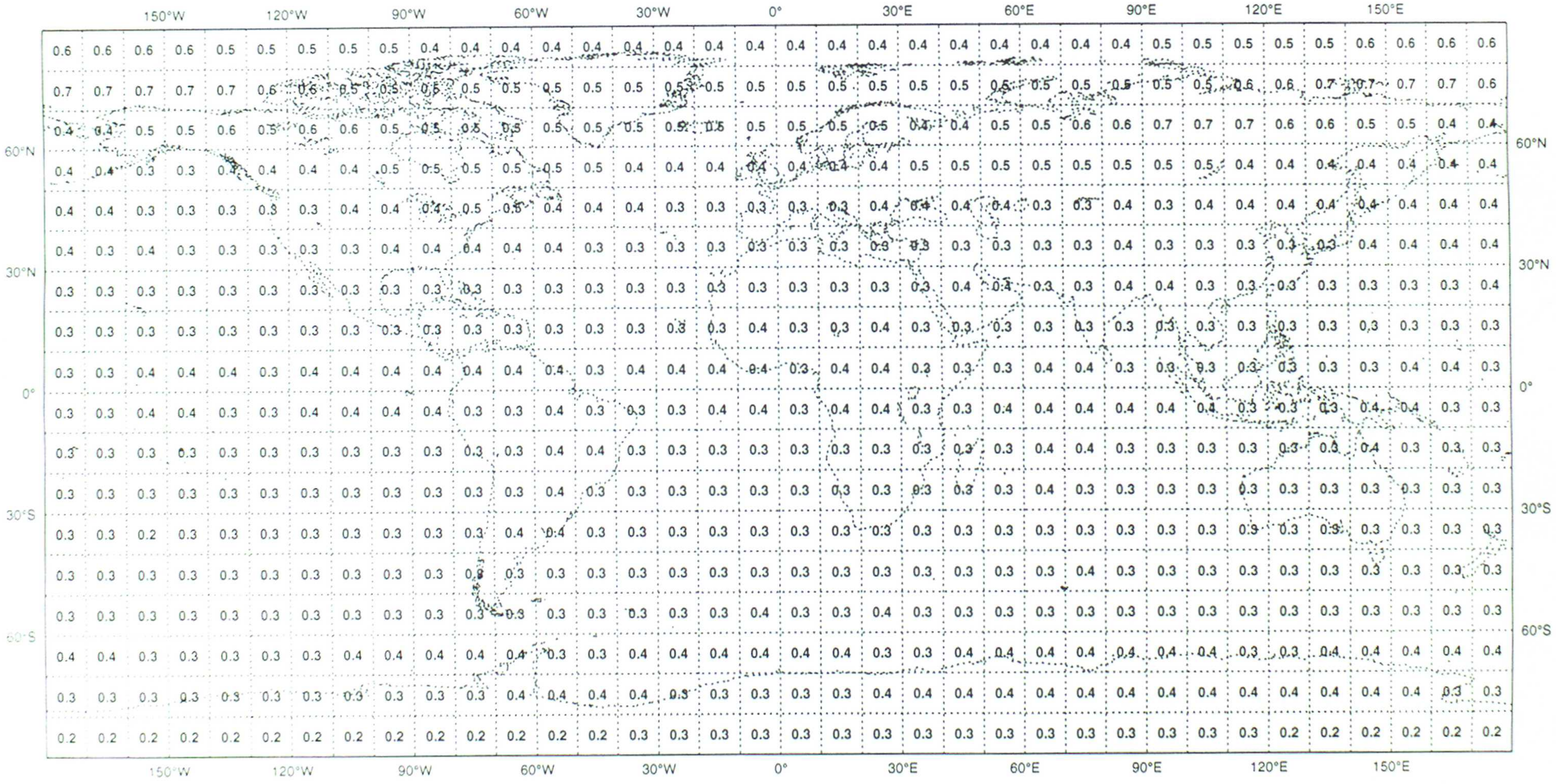
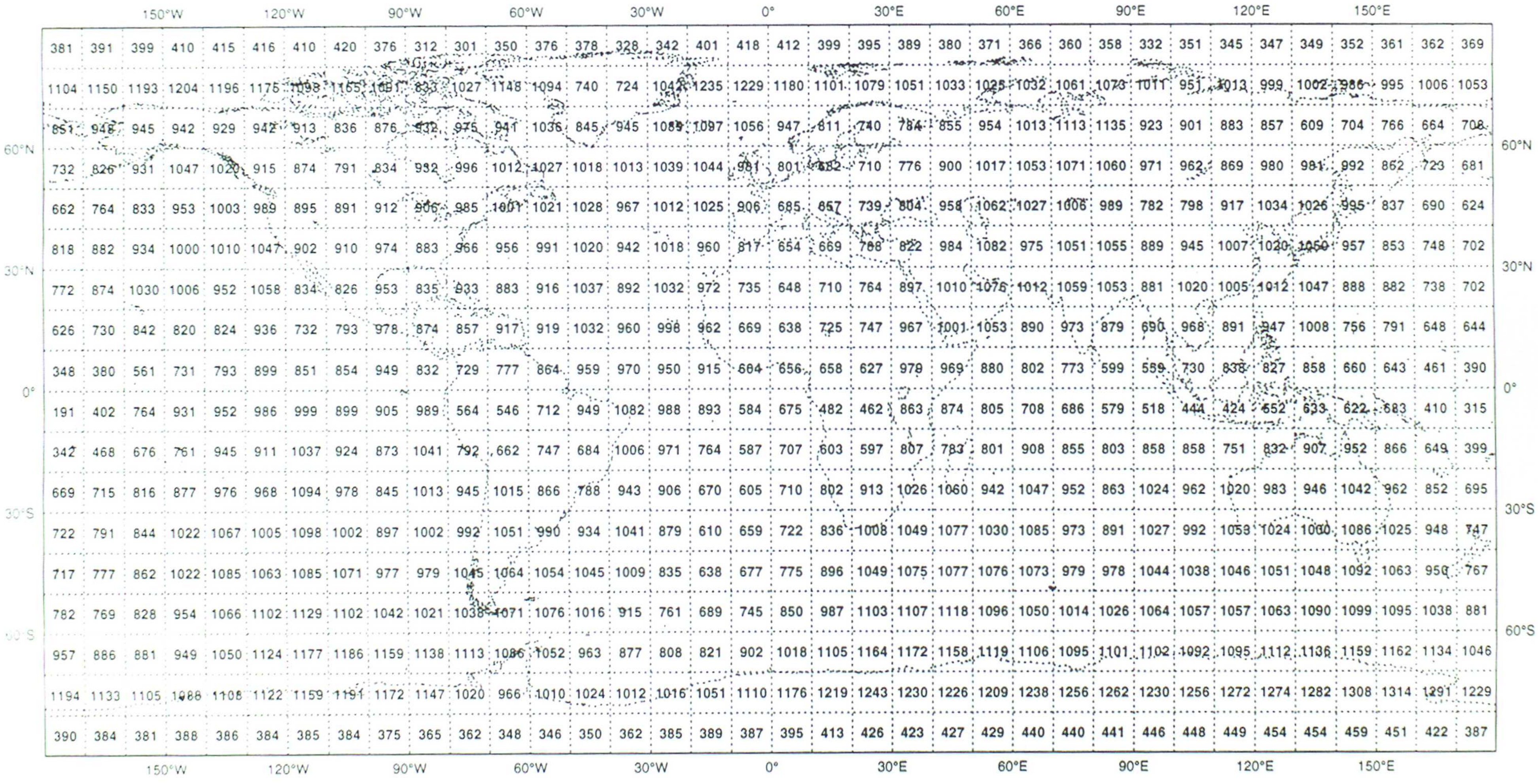

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.6 0.6 0.6 0.6 0.5 0.5 0.5 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.6 0.6 0.6 0.6
0.7 0.7 0.7 0.7 0.7 0.6 0.6 0.5 0.5 0.6 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.6 0.6 0.7 0.7 0.7 0.7 0.6
0.4 0.4 0.5 0.5 0.6 0.5 0.6 0.6 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.4 0.5 0.5 0.6 0.6 0.7 0.7 0.7 0.6 0.6 0.5 0.5 0.4 0.4
0.4 0.4 0.3 0.3 0.4 0.4 0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4
0.4 0.4 0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.4 0.5 0.5 0.4 0.4 0.4 0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.4 0.4 0.3 0.3 0.4 0.3 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4
0.4 0.3 0.4 0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.4 0.4 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.4 0.4
0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.3 0.3 0.4 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4
0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.3 0.3 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3
0.3 0.3 0.4 0.4 0.4 0.3 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.3 0.4 0.4 0.4 0.4 0.3 0.4 0.4 0.3 0.3 0.3 0.4 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.3
0.3 0.3 0.4 0.4 0.3 0.3 0.4 0.4 0.4 0.4 0.3 0.3 0.4 0.3 0.3 0.3 0.4 0.4 0.3 0.4 0.4 0.3 0.3 0.4 0.4 0.4 0.4 0.4 0.4 0.3 0.3 0.3 0.4 0.4 0.3 0.3
0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.3 0.3 0.3
0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3
0.3 0.3 0.2 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3
0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3
0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.3 0.3 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3
0.4 0.4 0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.4 0.4 0.4 0.3 0.3 0.4 0.4 0.4 0.4 0.4 0.4 0.3 0.3 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.3 0.3 0.4 0.4 0.4 0.4 0.4
0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.4 0.4 0.3 0.3 0.3 0.3 0.3 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.3 0.3
0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.2 0.2 0.2 0.2 0.2 0.2

Figure 40. ATOVS mean daily count. DECEMBER 2002
NOAA16, using all observations
Global average number of observations in 24 hours = 559030



381	391	399	410	415	416	410	420	376	312	301	350	376	378	328	342	401	418	412	399	395	389	380	371	366	360	358	332	351	345	347	349	352	361	362	369
1104	1150	1193	1204	1196	1175	1098	1165	1091	833	1027	1148	1094	740	724	1042	1235	1229	1180	1101	1079	1051	1033	1025	1032	1061	1073	1011	951	1013	999	1002	986	995	1006	1053
851	948	945	942	929	942	913	836	876	932	975	941	1036	845	945	1089	1097	1056	947	811	740	784	855	954	1013	1113	1135	923	901	883	857	609	704	766	664	708
732	826	931	1047	1020	915	874	791	834	932	996	1012	1027	1018	1013	1039	1044	981	801	682	710	776	900	1017	1053	1071	1060	971	962	869	980	981	992	862	723	681
662	764	833	953	1003	989	895	891	912	906	985	1001	1021	1028	967	1012	1025	906	685	657	739	804	958	1062	1027	1006	989	782	798	917	1034	1026	995	837	690	624
818	882	934	1000	1010	1047	902	910	974	883	966	956	991	1020	942	1018	960	817	654	669	788	822	984	1082	975	1051	1055	889	945	1007	1020	1050	957	853	748	702
772	874	1030	1006	952	1058	834	826	953	835	933	883	916	1037	892	1032	972	735	648	710	764	897	1010	1076	1012	1059	1053	881	1020	1005	1012	1047	888	882	738	702
626	730	842	820	824	936	732	793	978	874	857	917	919	1032	960	998	962	669	638	725	747	967	1001	1053	890	973	879	690	968	891	947	1008	756	791	648	644
348	380	561	731	793	899	851	854	949	832	729	777	864	959	970	950	915	604	656	658	627	979	969	880	802	773	599	559	730	838	827	858	660	643	461	390
191	402	764	931	952	986	999	899	905	989	564	546	712	949	1082	988	893	584	675	482	462	863	874	805	708	686	579	518	444	424	652	633	622	683	410	315
342	468	676	761	945	911	1037	924	873	1041	792	662	747	684	1006	971	764	587	707	603	597	807	783	801	908	855	803	858	858	751	832	907	952	866	649	399
669	715	816	877	976	968	1094	978	845	1013	945	1015	866	788	943	906	670	605	710	802	913	1026	1060	942	1047	952	863	1024	962	1020	983	946	1042	962	852	695
722	791	844	1022	1067	1005	1098	1002	897	1002	992	1051	990	934	1041	879	610	659	722	836	1008	1049	1077	1030	1085	973	891	1027	992	1053	1024	1000	1086	1025	948	747
717	777	862	1022	1085	1063	1085	1071	977	979	1045	1064	1054	1045	1009	835	638	677	775	896	1049	1075	1077	1076	1073	979	978	1044	1038	1046	1051	1048	1092	1063	950	767
782	769	828	954	1066	1102	1129	1102	1042	1021	1038	1071	1076	1016	915	761	689	745	850	987	1103	1107	1118	1096	1050	1014	1026	1064	1057	1057	1063	1090	1099	1095	1038	881
957	886	881	949	1050	1124	1177	1186	1159	1138	1113	1086	1052	963	877	808	821	902	1018	1105	1164	1172	1158	1119	1106	1095	1101	1102	1092	1095	1112	1136	1159	1162	1134	1046
1194	1133	1105	1088	1108	1122	1159	1191	1172	1147	1020	966	1010	1024	1012	1016	1051	1110	1176	1219	1243	1230	1226	1209	1238	1256	1262	1230	1256	1272	1274	1282	1308	1314	1291	1229
390	384	381	388	386	384	385	384	375	365	362	348	346	350	362	385	389	387	395	413	426	423	427	429	440	440	441	446	448	449	454	454	459	451	422	387

Figure 41. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS8 (Surface)
NOAA16, using all observations

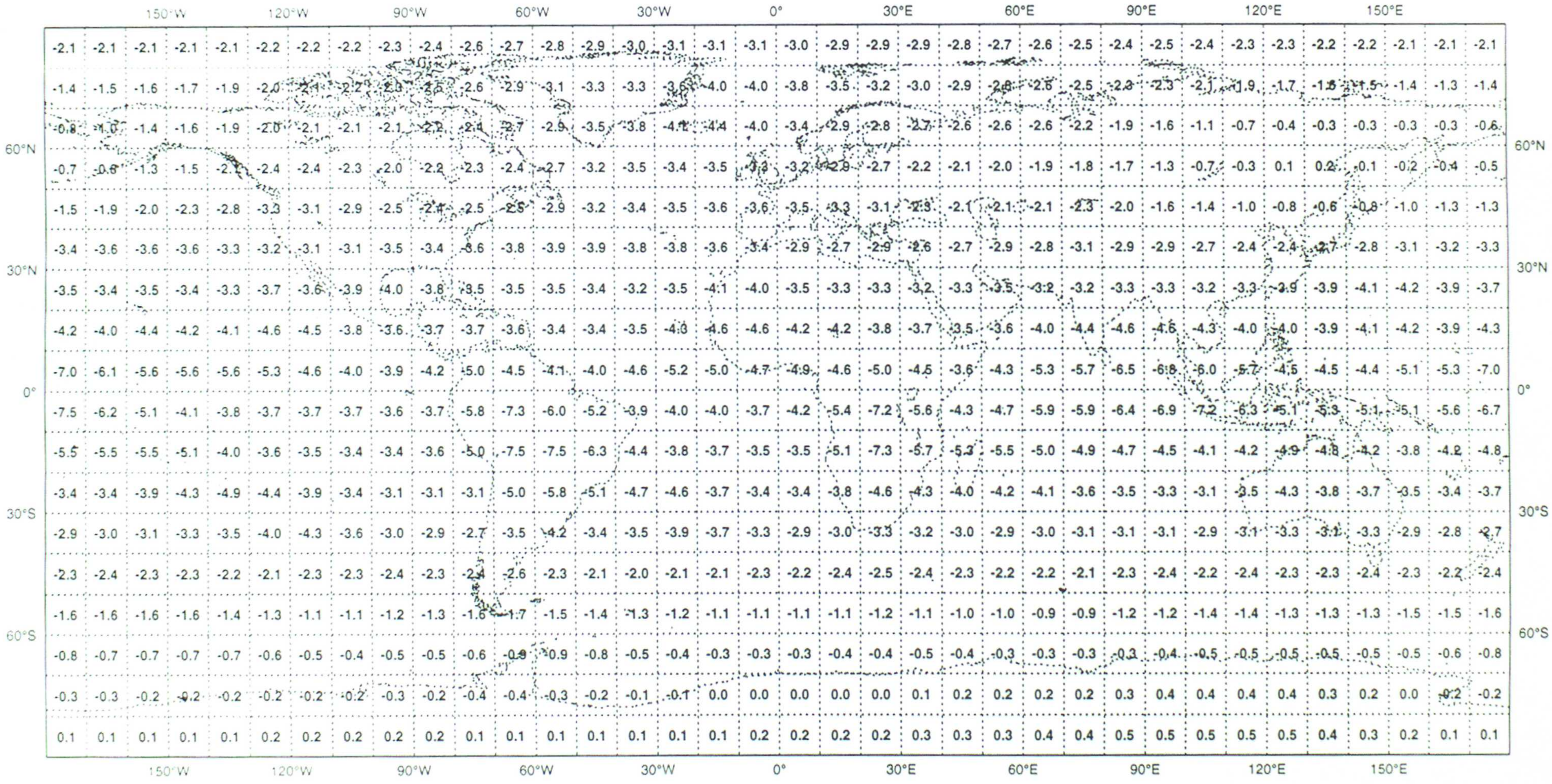

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-2.1 -2.1 -2.1 -2.1 -2.1 -2.2 -2.2 -2.2 -2.3 -2.4 -2.6 -2.7 -2.8 -2.9 -3.0 -3.1 -3.1 -3.1 -3.0 -2.9 -2.9 -2.9 -2.8 -2.7 -2.6 -2.5 -2.4 -2.5 -2.4 -2.3 -2.3 -2.2 -2.2 -2.1 -2.1 -2.1
-1.4 -1.5 -1.6 -1.7 -1.9 -2.0 -2.1 -2.2 -2.3 -2.5 -2.6 -2.9 -3.1 -3.3 -3.3 -3.6 -4.0 -4.0 -3.8 -3.5 -3.2 -3.0 -2.9 -2.8 -2.6 -2.5 -2.3 -2.3 -2.1 -1.9 -1.7 -1.6 -1.5 -1.4 -1.3 -1.4
-0.8 -1.0 -1.4 -1.6 -1.9 -2.0 -2.1 -2.1 -2.1 -2.2 -2.4 -2.7 -2.9 -3.5 -3.8 -4.1 -4.4 -4.0 -3.4 -2.9 -2.8 -2.7 -2.6 -2.6 -2.6 -2.2 -1.9 -1.6 -1.1 -0.7 -0.4 -0.3 -0.3 -0.3 -0.3 -0.6
-0.7 -0.6 -1.3 -1.5 -2.1 -2.4 -2.4 -2.3 -2.0 -2.2 -2.3 -2.4 -2.7 -3.2 -3.5 -3.4 -3.5 -3.3 -3.2 -2.9 -2.7 -2.2 -2.1 -2.0 -1.9 -1.8 -1.7 -1.3 -0.7 -0.3 0.1 0.2 -0.1 -0.2 -0.4 -0.5
-1.5 -1.9 -2.0 -2.3 -2.8 -3.3 -3.1 -2.9 -2.5 -2.4 -2.5 -2.5 -2.9 -3.2 -3.4 -3.5 -3.6 -3.6 -3.5 -3.3 -3.1 -2.3 -2.1 -2.1 -2.1 -2.3 -2.0 -1.6 -1.4 -1.0 -0.8 -0.6 -0.8 -1.0 -1.3 -1.3
-3.4 -3.6 -3.6 -3.6 -3.3 -3.2 -3.1 -3.1 -3.5 -3.4 -3.6 -3.8 -3.9 -3.9 -3.8 -3.8 -3.6 -3.4 -2.9 -2.7 -2.9 -2.6 -2.7 -2.9 -2.8 -3.1 -2.9 -2.9 -2.7 -2.4 -2.4 -2.7 -2.8 -3.1 -3.2 -3.3
-3.5 -3.4 -3.5 -3.4 -3.3 -3.7 -3.6 -3.9 -4.0 -3.8 -3.5 -3.5 -3.5 -3.4 -3.2 -3.5 -4.1 -4.0 -3.5 -3.3 -3.3 -3.2 -3.3 -3.5 -3.2 -3.2 -3.3 -3.3 -3.2 -3.3 -3.9 -3.9 -4.1 -4.2 -3.9 -3.7
-4.2 -4.0 -4.4 -4.2 -4.1 -4.6 -4.5 -3.8 -3.6 -3.7 -3.7 -3.6 -3.4 -3.4 -3.5 -4.3 -4.6 -4.6 -4.2 -4.2 -3.8 -3.7 -3.5 -3.6 -4.0 -4.4 -4.6 -4.6 -4.3 -4.0 -4.0 -3.9 -4.1 -4.2 -3.9 -4.3
-7.0 -6.1 -5.6 -5.6 -5.6 -5.3 -4.6 -4.0 -3.9 -4.2 -5.0 -4.5 -4.1 -4.0 -4.6 -5.2 -5.0 -4.7 -4.9 -4.6 -5.0 -4.5 -3.6 -4.3 -5.3 -5.7 -6.5 -6.8 -6.0 -5.7 -4.5 -4.5 -4.4 -5.1 -5.3 -7.0
-7.5 -6.2 -5.1 -4.1 -3.8 -3.7 -3.7 -3.7 -3.6 -3.7 -5.8 -7.3 -6.0 -5.2 -3.9 -4.0 -4.0 -3.7 -4.2 -5.4 -7.2 -5.6 -4.3 -4.7 -5.9 -5.9 -6.4 -6.9 -7.2 -6.3 -5.1 -5.3 -5.1 -5.1 -5.6 -6.7
-5.5 -5.5 -5.5 -5.1 -4.0 -3.6 -3.5 -3.4 -3.4 -3.6 -5.0 -7.5 -7.5 -6.3 -4.4 -3.8 -3.7 -3.5 -3.5 -5.1 -7.3 -5.7 -5.3 -5.5 -5.0 -4.9 -4.7 -4.5 -4.1 -4.2 -4.9 -4.8 -4.2 -3.8 -4.2 -4.8
-3.4 -3.4 -3.9 -4.3 -4.9 -4.4 -3.9 -3.4 -3.1 -3.1 -3.1 -5.0 -5.8 -5.1 -4.7 -4.6 -3.7 -3.4 -3.4 -3.8 -4.6 -4.3 -4.0 -4.2 -4.1 -3.6 -3.5 -3.3 -3.1 -3.5 -4.3 -3.8 -3.7 -3.5 -3.4 -3.7
-2.9 -3.0 -3.1 -3.3 -3.5 -4.0 -4.3 -3.6 -3.0 -2.9 -2.7 -3.5 -4.2 -3.4 -3.5 -3.9 -3.7 -3.3 -2.9 -3.0 -3.3 -3.2 -3.0 -2.9 -3.0 -3.1 -3.1 -3.1 -2.9 -3.1 -3.3 -3.1 -3.3 -2.9 -2.8 -2.7
-2.3 -2.4 -2.3 -2.3 -2.2 -2.1 -2.3 -2.3 -2.4 -2.3 -2.4 -2.6 -2.3 -2.1 -2.0 -2.1 -2.1 -2.3 -2.2 -2.4 -2.5 -2.4 -2.3 -2.2 -2.2 -2.1 -2.3 -2.4 -2.2 -2.4 -2.3 -2.3 -2.4 -2.3 -2.2 -2.4
-1.6 -1.6 -1.6 -1.6 -1.4 -1.3 -1.1 -1.1 -1.2 -1.3 -1.6 -1.7 -1.5 -1.4 -1.3 -1.2 -1.1 -1.1 -1.1 -1.1 -1.2 -1.1 -1.0 -1.0 -0.9 -0.9 -1.2 -1.2 -1.4 -1.4 -1.3 -1.3 -1.3 -1.5 -1.5 -1.6
-0.8 -0.7 -0.7 -0.7 -0.7 -0.6 -0.5 -0.4 -0.5 -0.5 -0.6 -0.9 -0.9 -0.8 -0.5 -0.4 -0.3 -0.3 -0.3 -0.4 -0.4 -0.5 -0.4 -0.3 -0.3 -0.3 -0.3 -0.4 -0.5 -0.5 -0.5 -0.5 -0.5 -0.5 -0.6 -0.8
-0.3 -0.3 -0.2 -0.2 -0.2 -0.2 -0.2 -0.2 -0.3 -0.2 -0.4 -0.4 -0.3 -0.2 -0.1 -0.1 0.0 0.0 0.0 0.0 0.0 0.1 0.2 0.2 0.2 0.2 0.3 0.4 0.4 0.4 0.4 0.3 0.2 0.0 -0.2 -0.2
0.1 0.1 0.1 0.1 0.1 0.2 0.2 0.2 0.2 0.2 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.2 0.2 0.2 0.2 0.3 0.3 0.3 0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.4 0.3 0.2 0.1 0.1

Figure 42. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS8 (Surface)
NOAA16, using all observations

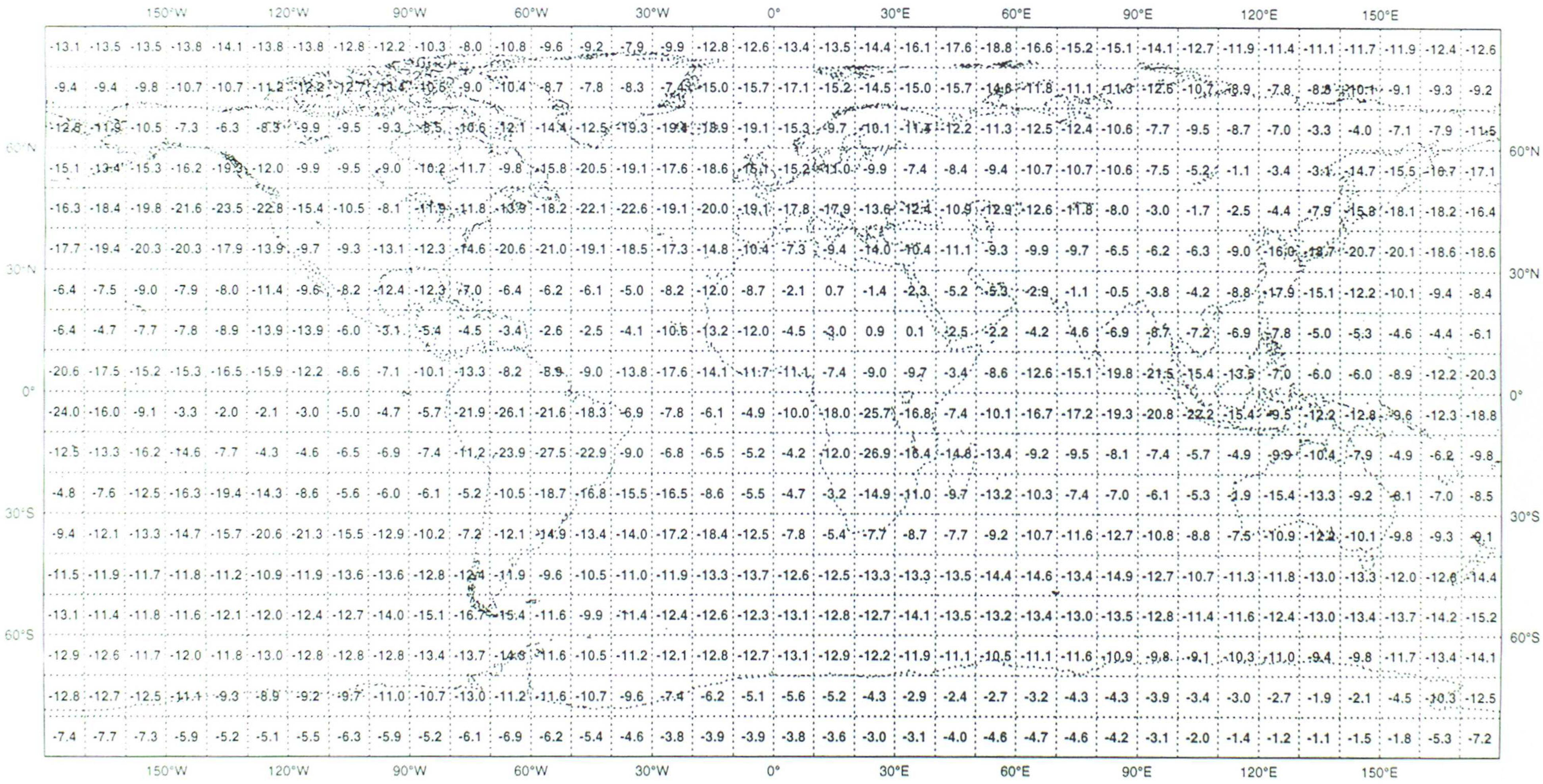
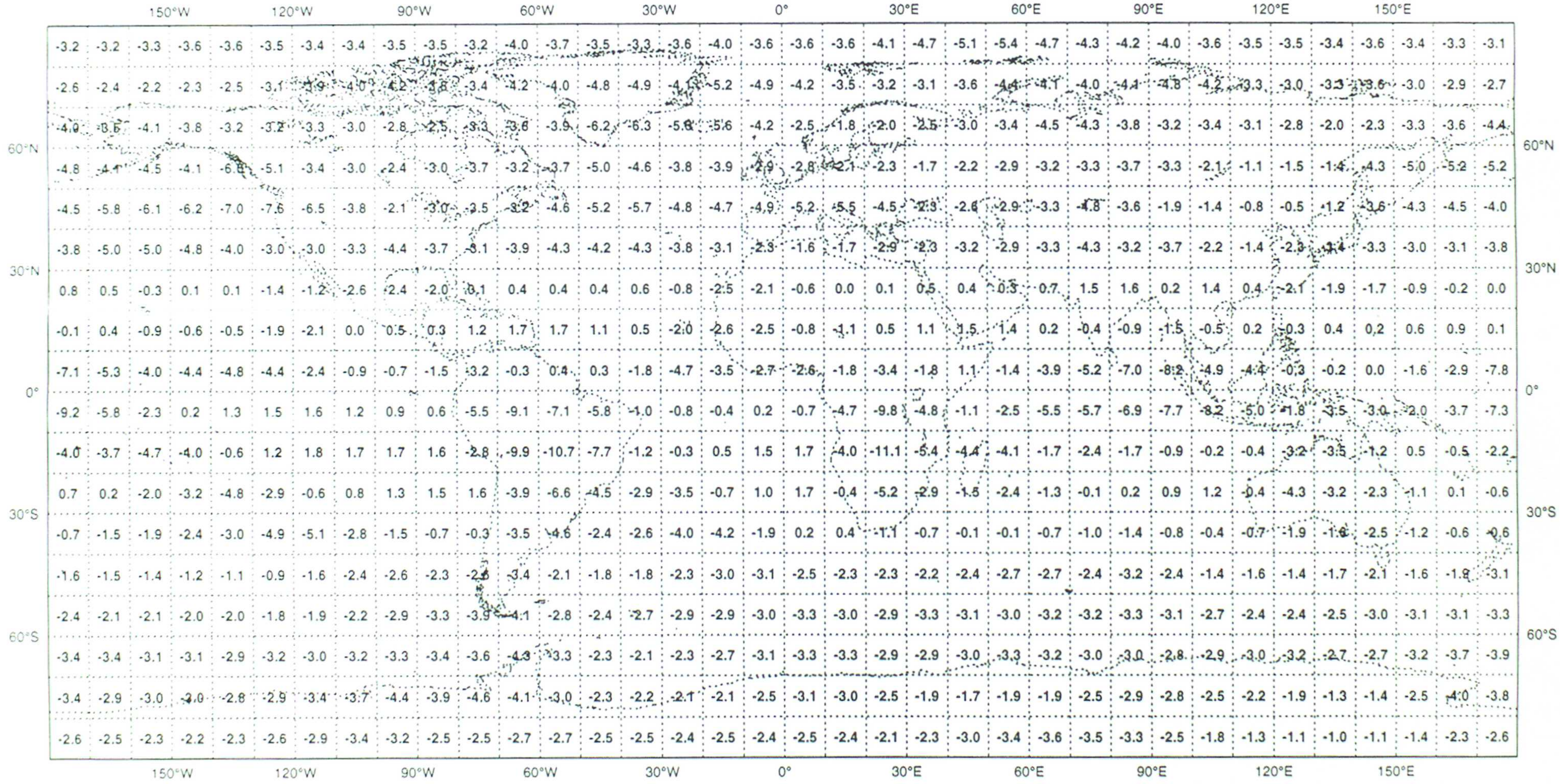

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-13.1 -13.5 -13.5 -13.8 -14.1 -13.8 -13.8 -12.8 -12.2 -10.3 -8.0 -10.8 -9.6 -9.2 -7.9 -9.9 -12.8 -12.6 -13.4 -13.5 -14.4 -16.1 -17.6 -18.8 -16.6 -15.2 -15.1 -14.1 -12.7 -11.9 -11.4 -11.1 -11.7 -11.9 -12.4 -12.6
-9.4 -9.4 -9.8 -10.7 -10.7 -11.2 -12.2 -12.7 -13.4 -10.6 -9.0 -10.4 -8.7 -7.8 -8.3 -7.4 -15.0 -15.7 -17.1 -15.2 -14.5 -15.0 -15.7 -14.6 -11.8 -11.1 -11.3 -12.6 -10.7 -8.9 -7.8 -8.8 -10.1 -9.1 -9.3 -9.2
-12.8 -11.9 -10.5 -7.3 -6.3 -8.3 -9.9 -9.5 -9.3 -8.5 -10.6 -12.1 -14.4 -12.5 -19.3 -19.4 -18.9 -19.1 -15.3 -9.7 -10.1 -11.4 -12.2 -11.3 -12.5 -12.4 -10.6 -7.7 -9.5 -8.7 -7.0 -3.3 -4.0 -7.1 -7.9 -11.5
-15.1 -13.4 -15.3 -16.2 -19.3 -12.0 -9.9 -9.5 -9.0 -10.2 -11.7 -9.8 -15.8 -20.5 -19.1 -17.6 -18.6 -15.1 -15.2 -11.0 -9.9 -7.4 -8.4 -9.4 -10.7 -10.7 -10.6 -7.5 -5.2 -1.1 -3.4 -3.1 -14.7 -15.5 -16.7 -17.1
-16.3 -18.4 -19.8 -21.6 -23.5 -22.8 -15.4 -10.5 -8.1 -11.9 -11.8 -13.9 -18.2 -22.1 -22.6 -19.1 -20.0 -19.1 -17.8 -17.9 -13.6 -12.4 -10.9 -12.9 -12.6 -11.8 -8.0 -3.0 -1.7 -2.5 -4.4 -7.9 -15.8 -18.1 -18.2 -16.4
-17.7 -19.4 -20.3 -20.3 -17.9 -13.9 -9.7 -9.3 -13.1 -12.3 -14.6 -20.6 -21.0 -19.1 -18.5 -17.3 -14.8 -10.4 -7.3 -9.4 -14.0 -10.4 -11.1 -9.3 -9.9 -9.7 -6.5 -6.2 -6.3 -9.0 -16.0 -18.7 -20.7 -20.1 -18.6 -18.6
-6.4 -7.5 -9.0 -7.9 -8.0 -11.4 -9.6 -8.2 -12.4 -12.3 -7.0 -6.4 -6.2 -6.1 -5.0 -8.2 -12.0 -8.7 -2.1 0.7 -1.4 -2.3 -5.2 -5.3 -2.9 -1.1 -0.5 -3.8 -4.2 -8.8 -17.9 -15.1 -12.2 -10.1 -9.4 -8.4
-6.4 -4.7 -7.7 -7.8 -8.9 -13.9 -13.9 -6.0 -3.1 -5.4 -4.5 -3.4 -2.6 -2.5 -4.1 -10.6 -13.2 -12.0 -4.5 -3.0 0.9 0.1 -2.5 -2.2 -4.2 -4.6 -6.9 -8.7 -7.2 -6.9 -7.8 -5.0 -5.3 -4.6 -4.4 -6.1
-20.6 -17.5 -15.2 -15.3 -16.5 -15.9 -12.2 -8.6 -7.1 -10.1 -13.3 -8.2 -8.9 -9.0 -13.8 -17.6 -14.1 -11.7 -11.1 -7.4 -9.0 -9.7 -3.4 -8.6 -12.6 -15.1 -19.8 -21.5 -15.4 -13.5 -7.0 -6.0 -6.0 -8.9 -12.2 -20.3
-24.0 -16.0 -9.1 -3.3 -2.0 -2.1 -3.0 -5.0 -4.7 -5.7 -21.9 -26.1 -21.6 -18.3 -6.9 -7.8 -6.1 -4.9 -10.0 -18.0 -25.7 -16.8 -7.4 -10.1 -16.7 -17.2 -19.3 -20.8 -22.2 -15.4 -9.5 -12.2 -12.8 -9.6 -12.3 -18.8
-12.5 -13.3 -16.2 -14.6 -7.7 -4.3 -4.6 -6.5 -6.9 -7.4 -11.2 -23.9 -27.5 -22.9 -9.0 -6.8 -6.5 -5.2 -4.2 -12.0 -26.9 -16.4 -14.8 -13.4 -9.2 -9.5 -8.1 -7.4 -5.7 -4.9 -9.9 -10.4 -7.9 -4.9 -6.2 -9.8
-4.8 -7.6 -12.5 -16.3 -19.4 -14.3 -8.6 -5.6 -6.0 -6.1 -5.2 -10.5 -18.7 -16.8 -15.5 -16.5 -8.6 -5.5 -4.7 -3.2 -14.9 -11.0 -9.7 -13.2 -10.3 -7.4 -7.0 -6.1 -5.3 -1.9 -15.4 -13.3 -9.2 -8.1 -7.0 -8.5
-9.4 -12.1 -13.3 -14.7 -15.7 -20.6 -21.3 -15.5 -12.9 -10.2 -7.2 -12.1 -14.9 -13.4 -14.0 -17.2 -18.4 -12.5 -7.8 -5.4 -7.7 -8.7 -7.7 -9.2 -10.7 -11.6 -12.7 -10.8 -8.8 -7.5 -10.9 -12.2 -10.1 -9.8 -9.3 -9.1
-11.5 -11.9 -11.7 -11.8 -11.2 -10.9 -11.9 -13.6 -13.6 -12.8 -12.4 -11.9 -9.6 -10.5 -11.0 -11.9 -13.3 -13.7 -12.6 -12.5 -13.3 -13.3 -13.5 -14.4 -14.6 -13.4 -14.9 -12.7 -10.7 -11.3 -11.8 -13.0 -13.3 -12.0 -12.6 -14.4
-13.1 -11.4 -11.8 -11.6 -12.1 -12.0 -12.4 -12.7 -14.0 -15.1 -16.7 -15.4 -11.6 -9.9 -11.4 -12.4 -12.6 -12.3 -13.1 -12.8 -12.7 -14.1 -13.5 -13.2 -13.4 -13.0 -13.5 -12.8 -11.4 -11.6 -12.4 -13.0 -13.4 -13.7 -14.2 -15.2
-12.9 -12.6 -11.7 -12.0 -11.8 -13.0 -12.8 -12.8 -12.8 -13.4 -13.7 -14.8 -11.6 -10.5 -11.2 -12.1 -12.8 -12.7 -13.1 -12.9 -12.2 -11.9 -11.1 -10.5 -11.1 -11.6 -10.9 -9.8 -9.1 -10.3 -11.0 -9.4 -9.8 -11.7 -13.4 -14.1
-12.8 -12.7 -12.5 -11.1 -9.3 -8.9 -9.2 -9.7 -11.0 -10.7 -13.0 -11.2 -11.6 -10.7 -9.6 -7.4 -6.2 -5.1 -5.6 -5.2 -4.3 -2.9 -2.4 -2.7 -3.2 -4.3 -4.3 -3.9 -3.4 -3.0 -2.7 -1.9 -2.1 -4.5 -10.3 -12.5
-7.4 -7.7 -7.3 -5.9 -5.2 -5.1 -5.5 -6.3 -5.9 -5.2 -6.1 -6.9 -6.2 -5.4 -4.6 -3.8 -3.9 -3.9 -3.8 -3.6 -3.0 -3.1 -4.0 -4.6 -4.7 -4.6 -4.2 -3.1 -2.0 -1.4 -1.2 -1.1 -1.5 -1.8 -5.3 -7.2

Figure 43. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS15 (700 hPa)
NOAA16, using all observations



-3.2	-3.2	-3.3	-3.6	-3.6	-3.5	-3.4	-3.4	-3.5	-3.5	-3.2	-4.0	-3.7	-3.5	-3.3	-3.6	-4.0	-3.6	-3.6	-3.6	-4.1	-4.7	-5.1	-5.4	-4.7	-4.3	-4.2	-4.0	-3.6	-3.5	-3.5	-3.4	-3.6	-3.4	-3.3	-3.1
-2.6	-2.4	-2.2	-2.3	-2.5	-3.1	-3.9	-4.0	-4.2	-3.8	-3.4	-4.2	-4.0	-4.8	-4.9	-4.1	-5.2	-4.9	-4.2	-3.5	-3.2	-3.1	-3.6	-4.4	-4.1	-4.0	-4.4	-4.8	-4.2	-3.3	-3.0	-3.3	-3.6	-3.0	-2.9	-2.7
-4.0	-3.6	-4.1	-3.8	-3.2	-3.2	-3.3	-3.0	-2.8	-2.5	-3.3	-3.6	-3.9	-6.2	-6.3	-5.8	-5.6	-4.2	-2.5	-1.8	-2.0	-2.5	-3.0	-3.4	-4.5	-4.3	-3.8	-3.2	-3.4	-3.1	-2.8	-2.0	-2.3	-3.3	-3.6	-4.4
-4.8	-4.4	-4.5	-4.1	-6.8	-5.1	-3.4	-3.0	-2.4	-3.0	-3.7	-3.2	-3.7	-5.0	-4.6	-3.8	-3.9	-2.9	-2.8	-2.1	-2.3	-1.7	-2.2	-2.9	-3.2	-3.3	-3.7	-3.3	-2.1	-1.1	-1.5	-1.4	-4.3	-5.0	-5.2	-5.2
-4.5	-5.8	-6.1	-6.2	-7.0	-7.6	-6.5	-3.8	-2.1	-3.0	-3.5	-3.2	-4.6	-5.2	-5.7	-4.8	-4.7	-4.9	-5.2	-5.5	-4.5	-2.3	-2.6	-2.9	-3.3	-4.8	-3.6	-1.9	-1.4	-0.8	-0.5	-1.2	-3.6	-4.3	-4.5	-4.0
-3.8	-5.0	-5.0	-4.8	-4.0	-3.0	-3.0	-3.3	-4.4	-3.7	-3.1	-3.9	-4.3	-4.2	-4.3	-3.8	-3.1	-2.3	-1.6	-1.7	-2.9	-2.3	-3.2	-2.9	-3.3	-4.3	-3.2	-3.7	-2.2	-1.4	-2.3	-3.4	-3.3	-3.0	-3.1	-3.8
0.8	0.5	-0.3	0.1	0.1	-1.4	-1.2	-2.6	-2.4	-2.0	0.1	0.4	0.4	0.4	0.6	-0.8	-2.5	-2.1	-0.6	0.0	0.1	0.5	0.4	0.3	0.7	1.5	1.6	0.2	1.4	0.4	-2.1	-1.9	-1.7	-0.9	-0.2	0.0
-0.1	0.4	-0.9	-0.6	-0.5	-1.9	-2.1	0.0	0.5	0.3	1.2	1.7	1.7	1.1	0.5	-2.0	-2.6	-2.5	-0.8	-1.1	0.5	1.1	1.5	1.4	0.2	-0.4	-0.9	-1.5	-0.5	0.2	-0.3	0.4	0.2	0.6	0.9	0.1
-7.1	-5.3	-4.0	-4.4	-4.8	-4.4	-2.4	-0.9	-0.7	-1.5	-3.2	-0.3	0.4	0.3	-1.8	-4.7	-3.5	-2.7	-2.6	-1.8	-3.4	-1.8	1.1	-1.4	-3.9	-5.2	-7.0	-8.2	-4.9	-4.4	-0.3	-0.2	0.0	-1.6	-2.9	-7.8
-9.2	-5.8	-2.3	0.2	1.3	1.5	1.6	1.2	0.9	0.6	-5.5	-9.1	-7.1	-5.8	-1.0	-0.8	-0.4	0.2	-0.7	-4.7	-9.8	-4.8	-1.1	-2.5	-5.5	-5.7	-6.9	-7.7	-8.2	-5.0	-1.8	-3.5	-3.0	-2.0	-3.7	-7.3
-4.0	-3.7	-4.7	-4.0	-0.6	1.2	1.8	1.7	1.7	1.6	-2.8	-9.9	-10.7	-7.7	-1.2	-0.3	0.5	1.5	1.7	-4.0	-11.1	-5.4	-4.4	-4.1	-1.7	-2.4	-1.7	-0.9	-0.2	-0.4	-3.2	-3.5	-1.2	0.5	-0.5	-2.2
0.7	0.2	-2.0	-3.2	-4.8	-2.9	-0.6	0.8	1.3	1.5	1.6	-3.9	-6.6	-4.5	-2.9	-3.5	-0.7	1.0	1.7	-0.4	-5.2	-2.9	-1.5	-2.4	-1.3	-0.1	0.2	0.9	1.2	-0.4	-4.3	-3.2	-2.3	-1.1	0.1	-0.6
-0.7	-1.5	-1.9	-2.4	-3.0	-4.9	-5.1	-2.8	-1.5	-0.7	-0.3	-3.5	-4.6	-2.4	-2.6	-4.0	-4.2	-1.9	0.2	0.4	-1.1	-0.7	-0.1	-0.1	-0.7	-1.0	-1.4	-0.8	-0.4	-0.7	-1.9	-1.6	-2.5	-1.2	-0.6	-0.6
-1.6	-1.5	-1.4	-1.2	-1.1	-0.9	-1.6	-2.4	-2.6	-2.3	-2.6	-3.4	-2.1	-1.8	-1.8	-2.3	-3.0	-3.1	-2.5	-2.3	-2.3	-2.2	-2.4	-2.7	-2.7	-2.4	-3.2	-2.4	-1.4	-1.6	-1.4	-1.7	-2.1	-1.6	-1.8	-3.1
-2.4	-2.1	-2.1	-2.0	-2.0	-1.8	-1.9	-2.2	-2.9	-3.3	-3.9	-4.1	-2.8	-2.4	-2.7	-2.9	-2.9	-3.0	-3.3	-3.0	-2.9	-3.3	-3.1	-3.0	-3.2	-3.2	-3.3	-3.1	-2.7	-2.4	-2.4	-2.5	-3.0	-3.1	-3.1	-3.3
-3.4	-3.4	-3.1	-3.1	-2.9	-3.2	-3.0	-3.2	-3.3	-3.4	-3.6	-4.3	-3.3	-2.3	-2.1	-2.3	-2.7	-3.1	-3.3	-3.3	-2.9	-2.9	-3.0	-3.3	-3.2	-3.0	-3.0	-2.8	-2.9	-3.0	-3.2	-2.7	-2.7	-3.2	-3.7	-3.9
-3.4	-2.9	-3.0	-3.0	-2.8	-2.9	-3.4	-3.7	-4.4	-3.9	-4.6	-4.1	-3.0	-2.3	-2.2	-2.1	-2.1	-2.5	-3.1	-3.0	-2.5	-1.9	-1.7	-1.9	-1.9	-2.5	-2.9	-2.8	-2.5	-2.2	-1.9	-1.3	-1.4	-2.5	-4.0	-3.8
-2.6	-2.5	-2.3	-2.2	-2.3	-2.6	-2.9	-3.4	-3.2	-2.5	-2.5	-2.7	-2.7	-2.5	-2.5	-2.4	-2.5	-2.4	-2.5	-2.4	-2.1	-2.3	-3.0	-3.4	-3.6	-3.5	-3.3	-2.5	-1.8	-1.3	-1.1	-1.0	-1.1	-1.4	-2.3	-2.6

Figure 44. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS15 (700 hPa)
NOAA16, using all observations

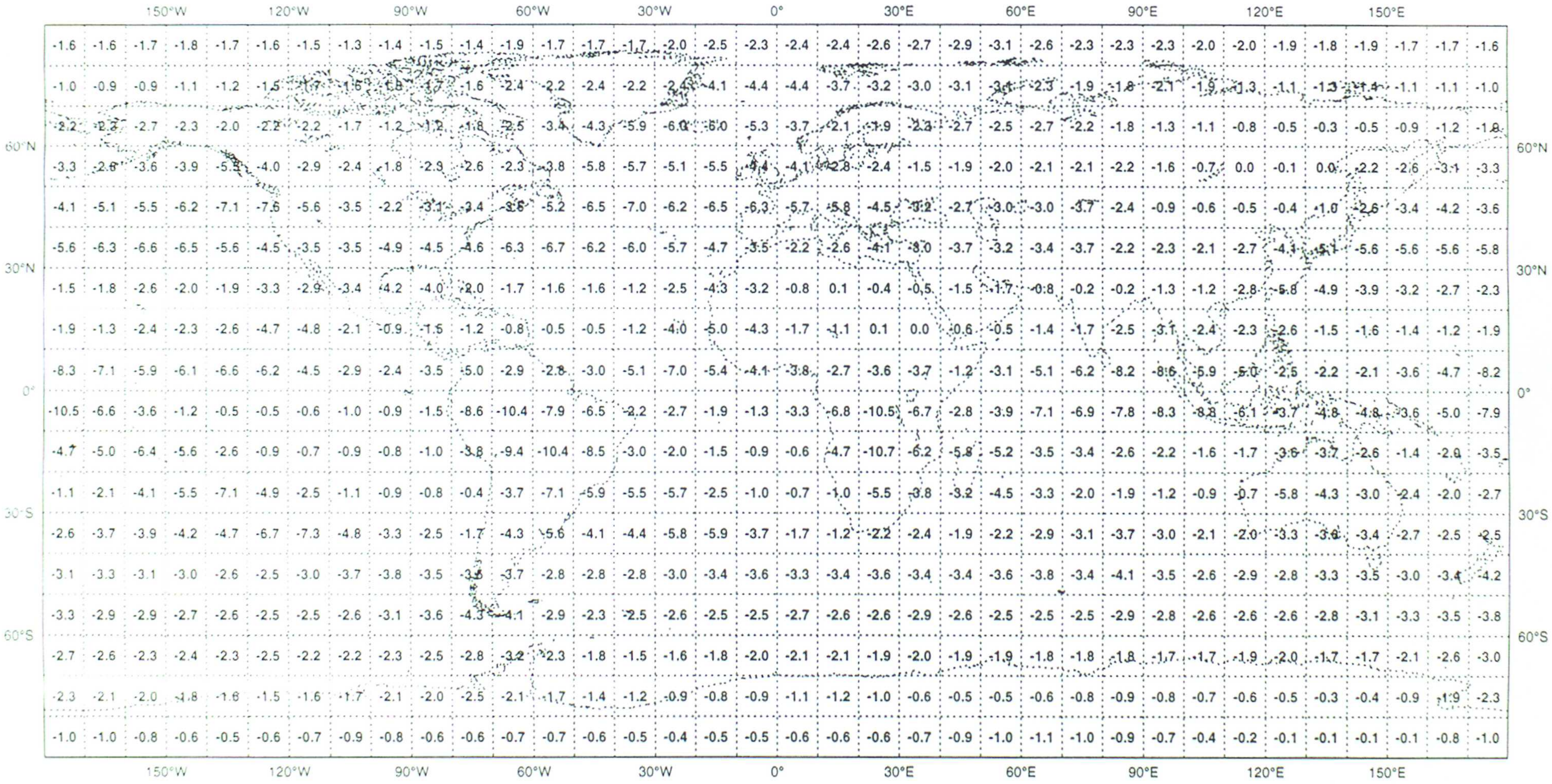

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-1.6 -1.6 -1.7 -1.8 -1.7 -1.6 -1.5 -1.3 -1.4 -1.5 -1.4 -1.9 -1.7 -1.7 -1.7 -2.0 -2.5 -2.3 -2.4 -2.4 -2.6 -2.7 -2.9 -3.1 -2.6 -2.3 -2.3 -2.3 -2.0 -2.0 -1.9 -1.8 -1.9 -1.7 -1.7 -1.6
-1.0 -0.9 -0.9 -1.1 -1.2 -1.5 -1.7 -1.6 -1.8 -1.7 -1.6 -2.4 -2.2 -2.4 -2.2 -2.4 -4.1 -4.4 -4.4 -3.7 -3.2 -3.0 -3.1 -3.1 -2.3 -1.9 -1.8 -2.1 -1.9 -1.3 -1.1 -1.3 -1.4 -1.1 -1.1 -1.0
-2.2 -2.2 -2.7 -2.3 -2.0 -2.2 -2.2 -1.7 -1.2 -1.2 -1.8 -2.5 -3.4 -4.3 -5.9 -6.0 -6.0 -5.3 -3.7 -2.1 -1.9 -2.3 -2.7 -2.5 -2.7 -2.2 -1.8 -1.3 -1.1 -0.8 -0.5 -0.3 -0.5 -0.9 -1.2 -1.8
-3.3 -2.6 -3.6 -3.9 -5.3 -4.0 -2.9 -2.4 -1.8 -2.9 -2.6 -2.3 -3.8 -5.8 -5.7 -5.1 -5.5 -4.4 -4.1 -2.8 -2.4 -1.5 -1.9 -2.0 -2.1 -2.1 -2.2 -1.6 -0.7 0.0 -0.1 0.0 -2.2 -2.6 -3.1 -3.3
-4.1 -5.1 -5.5 -6.2 -7.1 -7.6 -5.6 -3.5 -2.2 -3.1 -3.4 -3.6 -5.2 -6.5 -7.0 -6.2 -6.5 -6.3 -5.7 -5.8 -4.5 -3.2 -2.7 -3.0 -3.0 -3.7 -2.4 -0.9 -0.6 -0.5 -0.4 -1.0 -2.6 -3.4 -4.2 -3.6
-5.6 -6.3 -6.6 -6.5 -5.6 -4.5 -3.5 -3.5 -4.9 -4.5 -4.6 -6.3 -6.7 -6.2 -6.0 -5.7 -4.7 -3.5 -2.2 -2.6 -4.1 -3.0 -3.7 -3.2 -3.4 -3.7 -2.2 -2.3 -2.1 -2.7 -4.1 -5.1 -5.6 -5.6 -5.6 -5.8
-1.5 -1.8 -2.6 -2.0 -1.9 -3.3 -2.9 -3.4 -4.2 -4.0 -2.0 -1.7 -1.6 -1.6 -1.2 -2.5 -4.3 -3.2 -0.8 0.1 -0.4 -0.5 -1.5 -1.7 -0.8 -0.2 -0.2 -1.3 -1.2 -2.8 -5.8 -4.9 -3.9 -3.2 -2.7 -2.3
-1.9 -1.3 -2.4 -2.3 -2.6 -4.7 -4.8 -2.1 -0.9 -1.5 -1.2 -0.8 -0.5 -0.5 -1.2 -4.0 -5.0 -4.3 -1.7 -1.1 0.1 0.0 -0.6 -0.5 -1.4 -1.7 -2.5 -3.1 -2.4 -2.3 -2.6 -1.5 -1.6 -1.4 -1.2 -1.9
-8.3 -7.1 -5.9 -6.1 -6.6 -6.2 -4.5 -2.9 -2.4 -3.5 -5.0 -2.9 -2.8 -3.0 -5.1 -7.0 -5.4 -4.1 -3.8 -2.7 -3.6 -3.7 -1.2 -3.1 -5.1 -6.2 -8.2 -8.6 -5.9 -5.0 -2.5 -2.2 -2.1 -3.6 -4.7 -8.2
-10.5 -6.6 -3.6 -1.2 -0.5 -0.5 -0.6 -1.0 -0.9 -1.5 -8.6 -10.4 -7.9 -6.5 -2.2 -2.7 -1.9 -1.3 -3.3 -6.8 -10.5 -6.7 -2.8 -3.9 -7.1 -6.9 -7.8 -8.3 -8.8 -6.1 -3.7 -4.8 -4.8 -3.6 -5.0 -7.9
-4.7 -5.0 -6.4 -5.6 -2.6 -0.9 -0.7 -0.9 -0.8 -1.0 -3.8 -9.4 -10.4 -8.5 -3.0 -2.0 -1.5 -0.9 -0.6 -4.7 -10.7 -6.2 -5.8 -5.2 -3.5 -3.4 -2.6 -2.2 -1.6 -1.7 -3.6 -3.7 -2.6 -1.4 -2.0 -3.5
-1.1 -2.1 -4.1 -5.5 -7.1 -4.9 -2.5 -1.1 -0.9 -0.8 -0.4 -3.7 -7.1 -5.9 -5.5 -5.7 -2.5 -1.0 -0.7 -1.0 -5.5 -3.8 -3.2 -4.5 -3.3 -2.0 -1.9 -1.2 -0.9 -0.7 -5.8 -4.3 -3.0 -2.4 -2.0 -2.7
-2.6 -3.7 -3.9 -4.2 -4.7 -6.7 -7.3 -4.8 -3.3 -2.5 -1.7 -4.3 -5.6 -4.1 -4.4 -5.8 -5.9 -3.7 -1.7 -1.2 -2.2 -2.4 -1.9 -2.2 -2.9 -3.1 -3.7 -3.0 -2.1 -2.0 -3.3 -3.6 -3.4 -2.7 -2.5 -2.5
-3.1 -3.3 -3.1 -3.0 -2.6 -2.5 -3.0 -3.7 -3.8 -3.5 -3.5 -3.7 -2.8 -2.8 -2.8 -3.0 -3.4 -3.6 -3.3 -3.4 -3.6 -3.4 -3.4 -3.6 -3.8 -3.4 -4.1 -3.5 -2.6 -2.9 -2.8 -3.3 -3.5 -3.0 -3.4 -4.2
-3.3 -2.9 -2.9 -2.7 -2.6 -2.5 -2.5 -2.6 -3.1 -3.6 -4.3 -4.1 -2.9 -2.3 -2.5 -2.6 -2.5 -2.5 -2.7 -2.6 -2.6 -2.9 -2.6 -2.5 -2.5 -2.5 -2.9 -2.8 -2.6 -2.6 -2.6 -2.8 -3.1 -3.3 -3.5 -3.8
-2.7 -2.6 -2.3 -2.4 -2.3 -2.5 -2.2 -2.2 -2.3 -2.5 -2.8 -3.2 -2.3 -1.8 -1.5 -1.6 -1.8 -2.0 -2.1 -2.1 -1.9 -2.0 -1.9 -1.9 -1.8 -1.8 -1.8 -1.7 -1.7 -1.9 -2.0 -1.7 -1.7 -2.1 -2.6 -3.0
-2.3 -2.1 -2.0 -1.8 -1.6 -1.5 -1.6 -1.7 -2.1 -2.0 -2.5 -2.1 -1.7 -1.4 -1.2 -0.9 -0.8 -0.9 -1.1 -1.2 -1.0 -0.6 -0.5 -0.5 -0.6 -0.8 -0.9 -0.8 -0.7 -0.6 -0.5 -0.3 -0.4 -0.9 -1.9 -2.3
-1.0 -1.0 -0.8 -0.6 -0.5 -0.6 -0.7 -0.9 -0.8 -0.6 -0.6 -0.7 -0.7 -0.6 -0.5 -0.4 -0.5 -0.5 -0.6 -0.6 -0.6 -0.7 -0.9 -1.0 -1.1 -1.0 -0.9 -0.7 -0.4 -0.2 -0.1 -0.1 -0.1 -0.1 -0.8 -1.0

Figure 45. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations

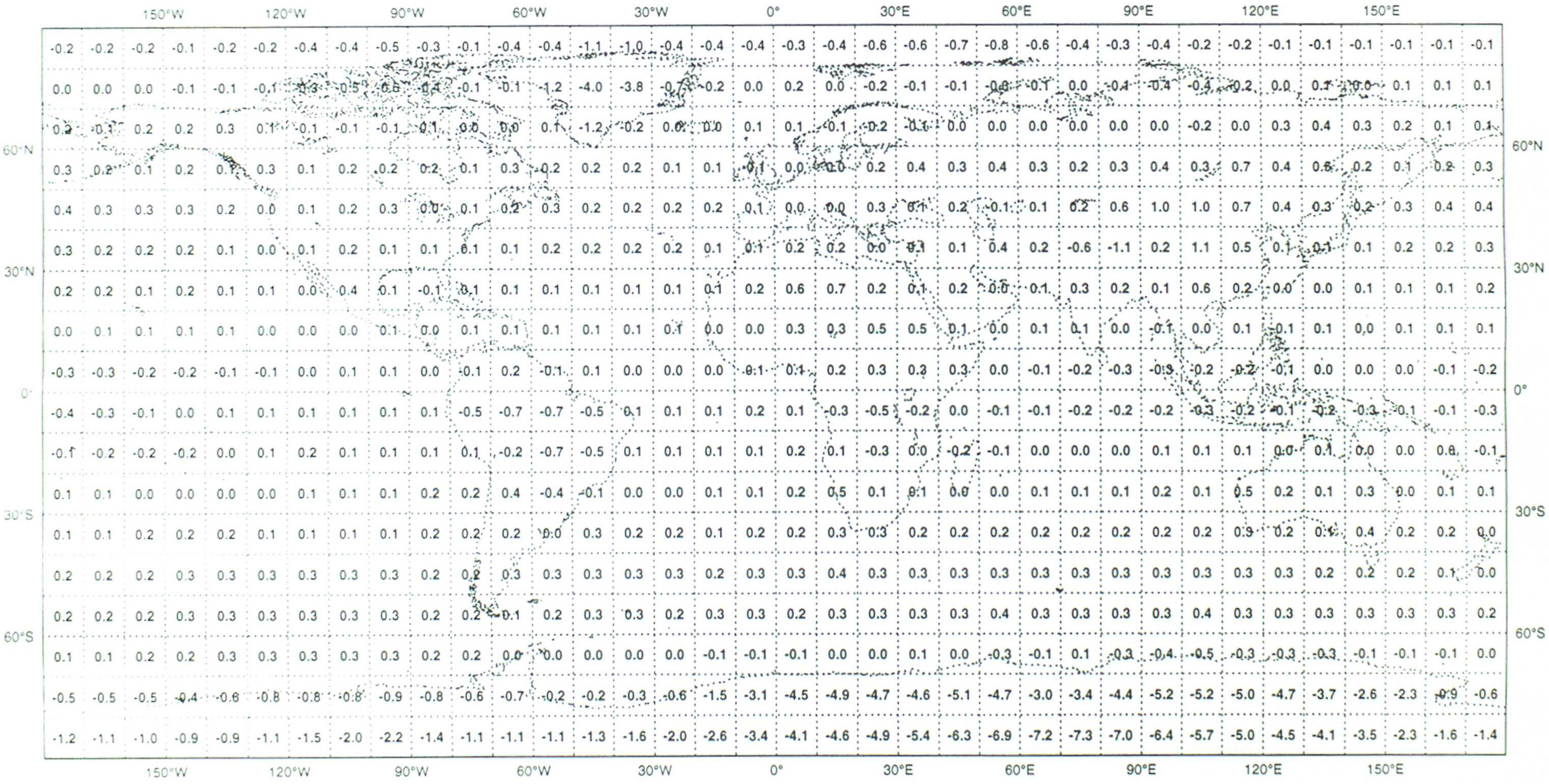
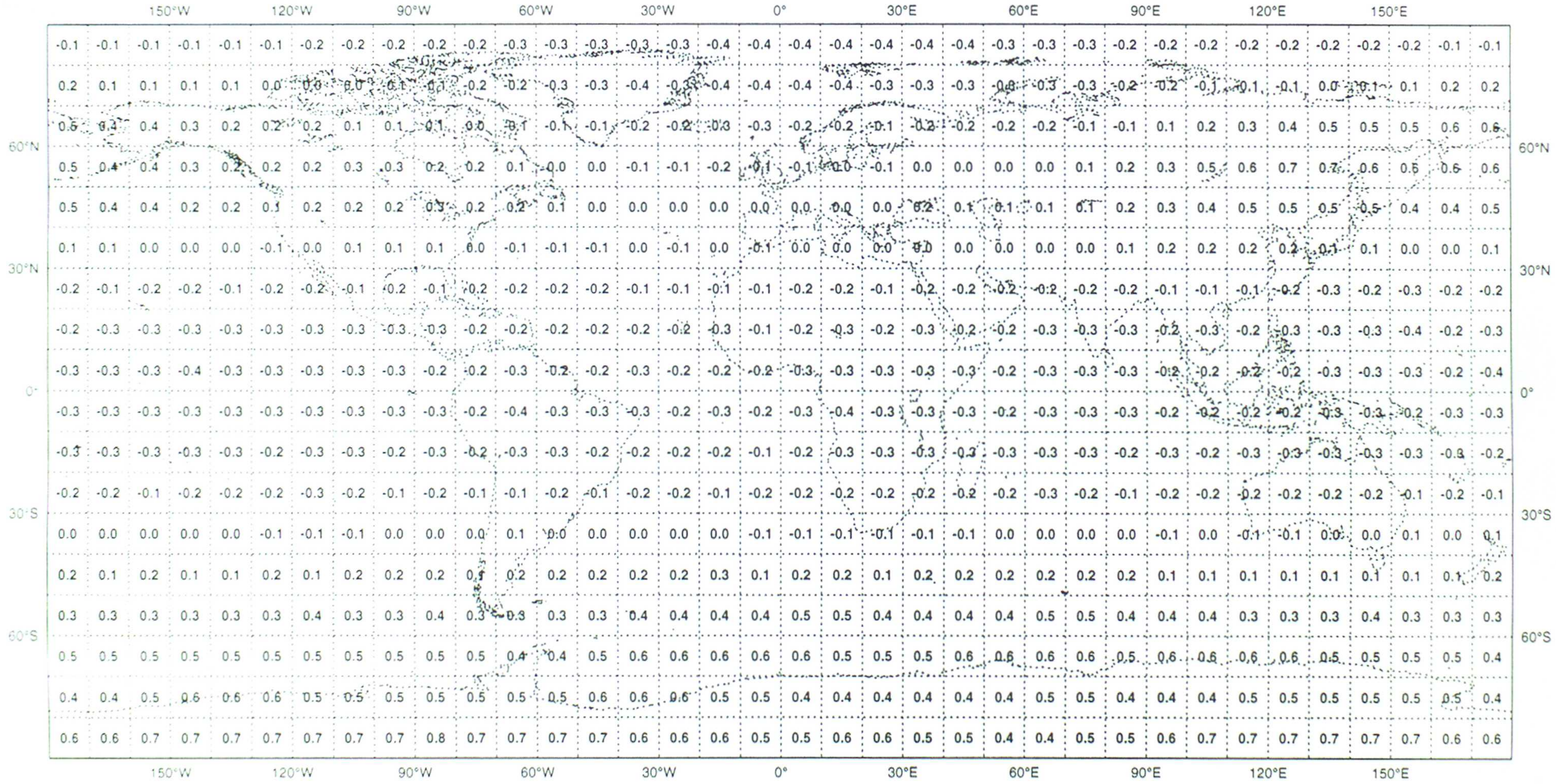
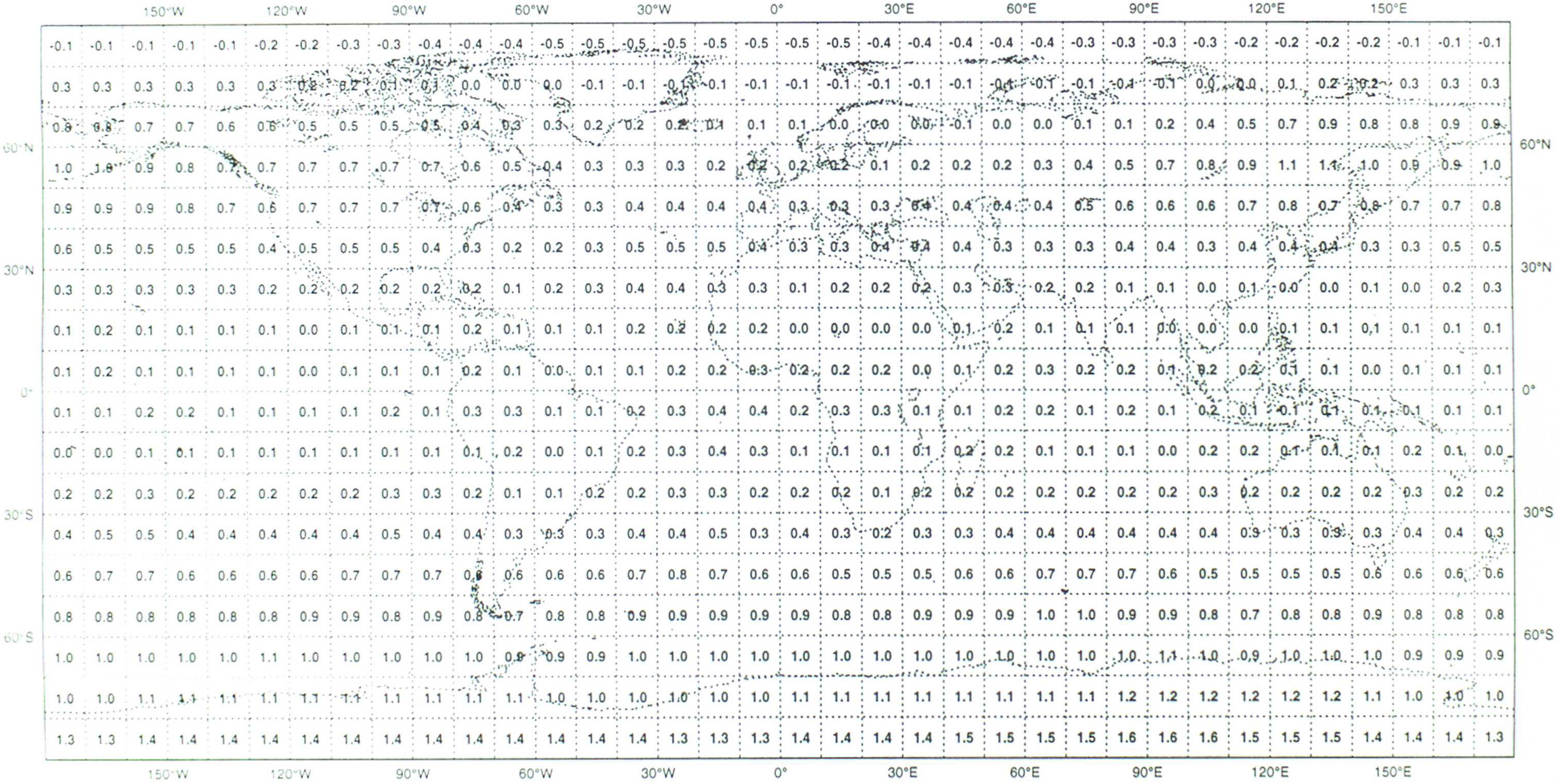

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
-0.2 -0.2 -0.2 -0.1 -0.2 -0.2 -0.4 -0.4 -0.5 -0.3 -0.1 -0.4 -0.4 -1.1 -1.0 -0.4 -0.4 -0.4 -0.3 -0.4 -0.6 -0.6 -0.7 -0.8 -0.6 -0.4 -0.3 -0.4 -0.2 -0.2 -0.1 -0.1 -0.1 -0.1 -0.1 -0.1
0.0 0.0 0.0 -0.1 -0.1 -0.1 -0.3 -0.5 -0.6 -0.4 -0.1 -0.1 -1.2 -4.0 -3.8 -0.7 -0.2 0.0 0.2 0.0 -0.2 -0.1 -0.1 -0.8 -0.1 0.0 -0.4 -0.4 -0.4 -0.2 0.0 0.1 0.0 0.1 0.1 0.1
0.2 -0.1 0.2 0.2 0.3 0.1 -0.1 -0.1 -0.1 0.1 0.0 0.0 0.1 -1.2 -0.2 0.0 0.0 0.1 0.1 -0.1 -0.2 -0.1 0.0 0.0 0.0 0.0 0.0 0.0 -0.2 0.0 0.3 0.4 0.3 0.2 0.1 0.1
0.3 0.2 0.1 0.2 0.1 0.3 0.1 0.2 0.2 0.2 -0.1 0.3 -0.2 0.2 0.2 0.1 0.1 -0.1 0.0 0.0 0.2 0.4 0.3 0.4 0.3 0.2 0.3 0.4 0.3 0.7 0.4 0.6 0.2 0.1 0.2 0.3
0.4 0.3 0.3 0.3 0.2 0.0 0.1 0.2 0.3 0.0 0.1 0.2 0.3 0.2 0.2 0.2 0.2 0.1 0.0 0.0 0.3 0.1 0.2 -0.1 0.1 0.2 0.6 1.0 1.0 0.7 0.4 0.3 0.2 0.3 0.4 0.4
0.3 0.2 0.2 0.2 0.1 0.0 0.1 0.2 0.1 0.1 0.1 0.1 0.2 0.2 0.2 0.2 0.1 0.1 0.2 0.2 0.0 0.1 0.1 0.4 0.2 -0.6 -1.1 0.2 1.1 0.5 0.1 0.1 0.1 0.2 0.2 0.3
0.2 0.2 0.1 0.2 0.1 0.1 0.0 0.4 0.1 -0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.2 0.6 0.7 0.2 0.1 0.2 0.0 0.1 0.3 0.2 0.1 0.6 0.2 0.0 0.0 0.1 0.1 0.1 0.2
0.0 0.1 0.1 0.1 0.1 0.0 0.0 0.0 0.1 0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.0 0.0 0.3 0.3 0.5 0.5 0.1 0.0 0.1 0.1 0.0 -0.1 0.0 0.1 -0.1 0.1 0.0 0.1 0.1 0.1
-0.3 -0.3 -0.2 -0.2 -0.1 -0.1 0.0 0.1 0.1 0.0 -0.1 0.2 -0.1 0.1 0.0 0.0 0.0 0.1 0.1 0.2 0.3 0.3 0.3 0.0 -0.1 -0.2 -0.3 -0.3 -0.2 -0.2 -0.1 0.0 0.0 0.0 -0.1 -0.2
-0.4 -0.3 -0.1 0.0 0.1 0.1 0.1 0.1 0.1 0.1 -0.5 -0.7 -0.7 -0.5 0.1 0.1 0.1 0.2 0.1 -0.3 -0.5 -0.2 0.0 -0.1 -0.1 -0.2 -0.2 -0.2 -0.3 -0.2 -0.1 -0.2 -0.3 -0.1 -0.1 -0.3
-0.1 -0.2 -0.2 -0.2 0.0 0.1 0.2 0.1 0.1 0.1 0.1 -0.2 -0.7 -0.5 0.1 0.1 0.1 0.1 0.2 0.1 -0.3 0.0 -0.2 -0.1 0.0 0.0 0.0 0.1 0.1 0.1 0.0 0.1 0.0 0.0 0.0 -0.1
0.1 0.1 0.0 0.0 0.0 0.0 0.1 0.1 0.1 0.2 0.2 0.4 -0.4 -0.1 0.0 0.0 0.1 0.1 0.2 0.5 0.1 0.1 0.0 0.0 0.1 0.1 0.1 0.2 0.1 0.5 0.2 0.1 0.3 0.0 0.1 0.1
0.1 0.1 0.2 0.2 0.2 0.1 0.1 0.1 0.1 0.2 0.2 0.2 0.0 0.3 0.2 0.2 0.1 0.2 0.2 0.3 0.3 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.2 0.9 0.2 0.1 0.4 0.2 0.2 0.0
0.2 0.2 0.2 0.3 0.3 0.3 0.3 0.3 0.3 0.2 0.2 0.3 0.3 0.3 0.3 0.3 0.2 0.3 0.3 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.2 0.2 0.2 0.1 0.0
0.2 0.2 0.2 0.3 0.3 0.3 0.3 0.3 0.3 0.2 0.2 0.1 0.2 0.3 0.3 0.2 0.3 0.3 0.2 0.3 0.3 0.3 0.3 0.4 0.3 0.3 0.3 0.3 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.2
0.1 0.1 0.2 0.2 0.3 0.3 0.3 0.3 0.3 0.2 0.2 0.0 0.0 0.0 0.0 0.0 -0.1 -0.1 -0.1 0.0 0.0 0.1 0.0 -0.3 -0.1 0.1 -0.3 -0.4 -0.5 -0.3 -0.3 -0.3 -0.1 -0.1 -0.1 0.0
-0.5 -0.5 -0.5 -0.4 -0.6 -0.8 -0.8 -0.8 -0.9 -0.8 -0.6 -0.7 -0.2 -0.2 -0.3 -0.6 -1.5 -3.1 -4.5 -4.9 -4.7 -4.6 -5.1 -4.7 -3.0 -3.4 -4.4 -5.2 -5.2 -5.0 -4.7 -3.7 -2.6 -2.3 -0.9 -0.6
-1.2 -1.1 -1.0 -0.9 -0.9 -1.1 -1.5 -2.0 -2.2 -1.4 -1.1 -1.1 -1.1 -1.3 -1.6 -2.0 -2.6 -3.4 -4.1 -4.6 -4.9 -5.4 -6.3 -6.9 -7.2 -7.3 -7.0 -6.4 -5.7 -5.0 -4.5 -4.1 -3.5 -2.3 -1.6 -1.4
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E

Figure 46. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA16, using all observations



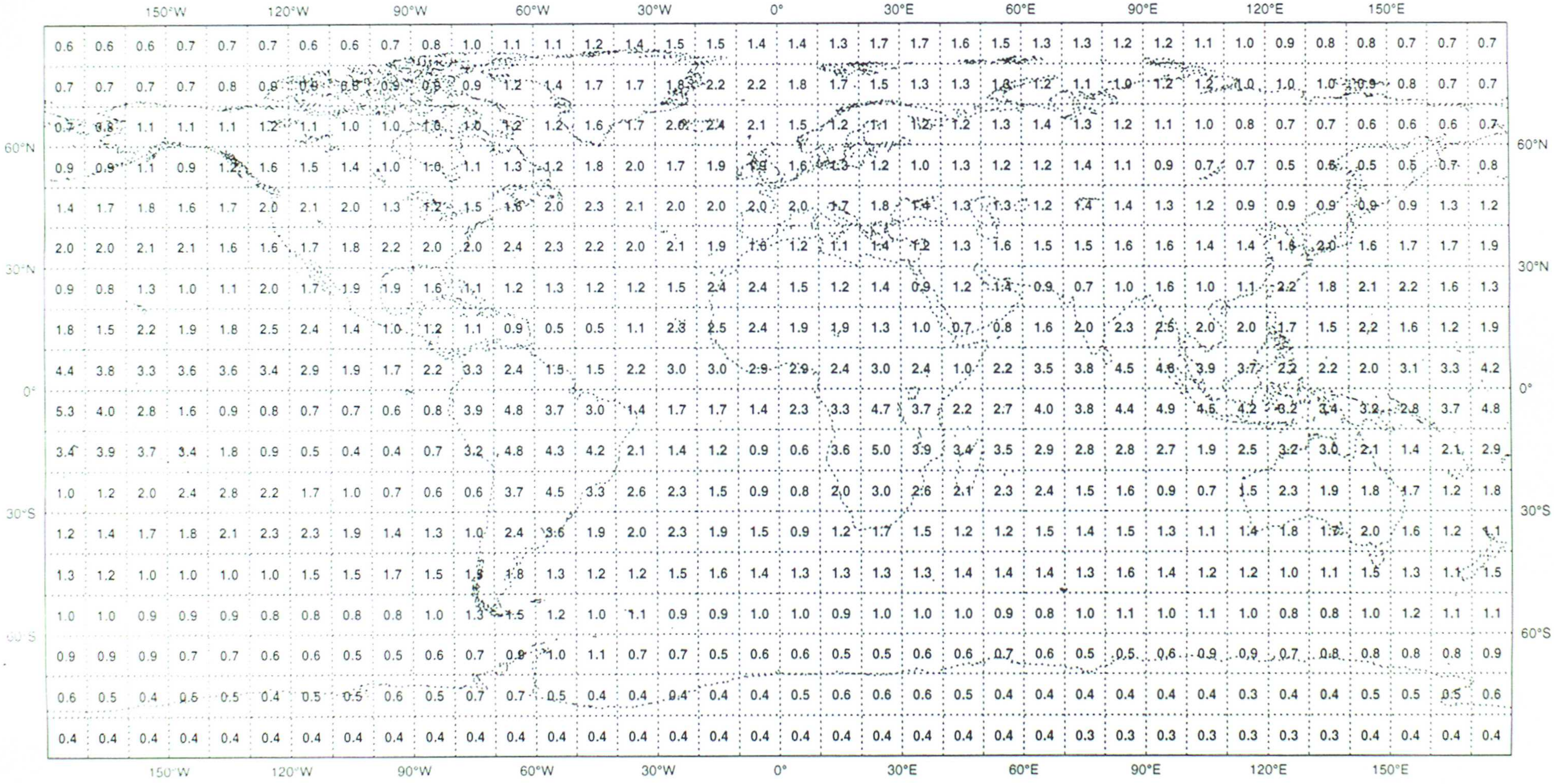
-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1
0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.3	-0.4	-0.4	-0.4	-0.4	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.1	-0.1	-0.1	0.0	0.1	0.1	0.2	0.2
0.6	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.6	0.6
0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.1	-0.0	0.0	-0.1	-0.1	-0.2	-0.1	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.5	0.6	0.7	0.7	0.6	0.6	0.6	0.6
0.5	0.4	0.4	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.5
0.1	0.1	0.0	0.0	0.0	-0.1	0.0	0.1	0.1	0.1	0.0	-0.1	-0.1	-0.1	0.0	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.1
-0.2	-0.1	-0.2	-0.2	-0.1	-0.2	-0.2	-0.1	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.3	-0.2	-0.3	-0.2	-0.2
-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.1	-0.2	-0.3	-0.2	-0.3	-0.2	-0.2	-0.3	-0.3	-0.3	-0.2	-0.3	-0.2	-0.3	-0.3	-0.3	-0.4	-0.2	-0.3
-0.3	-0.3	-0.3	-0.4	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.3	-0.2	-0.2	-0.3	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.2	-0.4
-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.4	-0.3	-0.3	-0.3	-0.2	-0.3	-0.2	-0.3	-0.4	-0.3	-0.3	-0.3	-0.2	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.2	-0.3	-0.3
-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.3	-0.2	-0.3	-0.2	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2
-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.3	-0.2	-0.1	-0.2	-0.1	-0.1	-0.2	-0.1	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.1
0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	-0.1	0.0	0.0	0.1	0.0	0.1
0.2	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.1	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.4
0.4	0.4	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.4
0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.5	0.5	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6

Figure 47. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



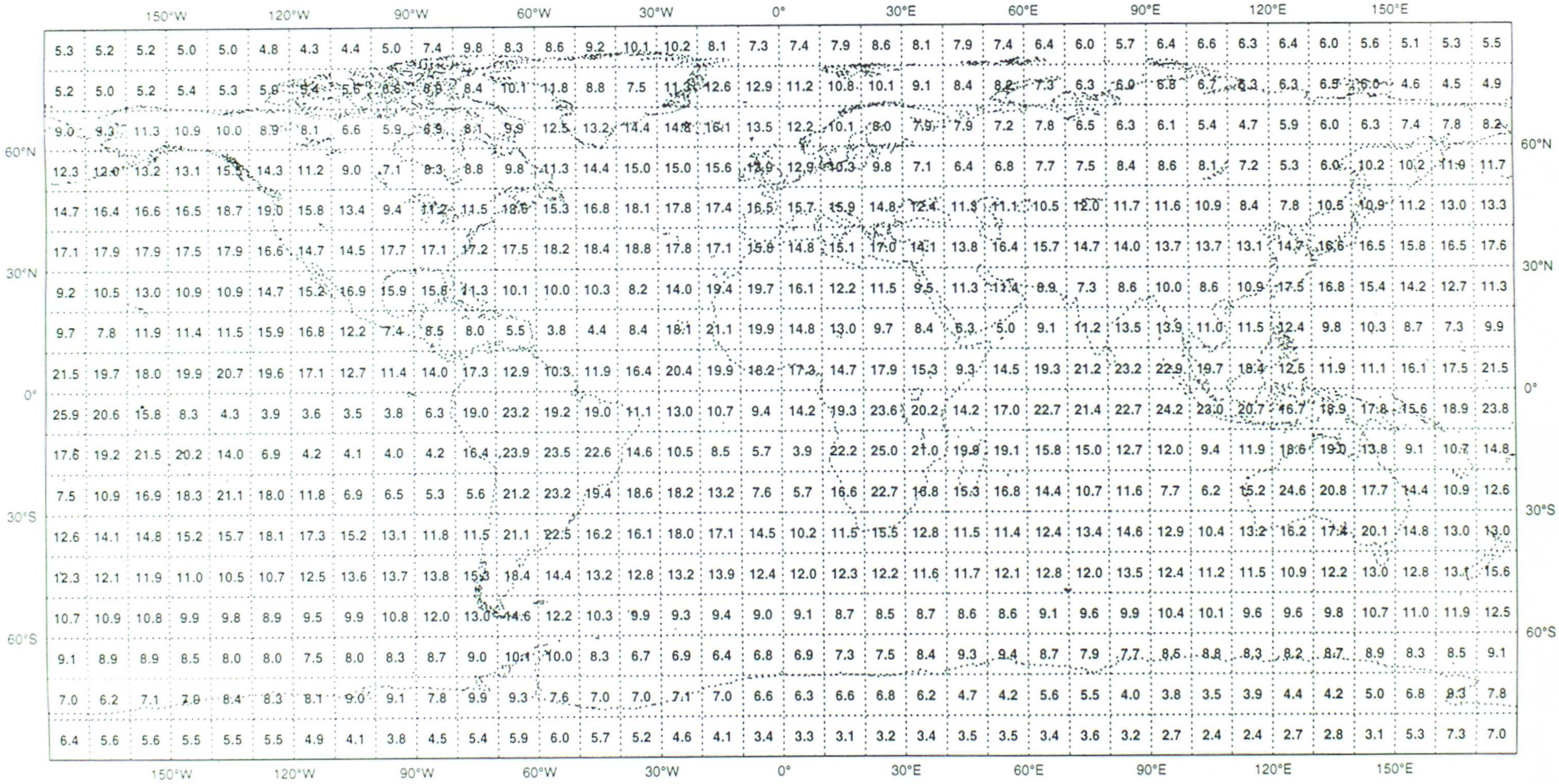
-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.4	-0.4	-0.4	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.5	-0.4	-0.4	-0.4	-0.4	-0.4	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1
0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.3
0.8	0.8	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	-0.1	0.0	0.0	0.1	0.1	0.2	0.4	0.5	0.7	0.9	0.8	0.8	0.9	0.9
1.0	1.0	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.5	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.3	0.4	0.5	0.7	0.8	0.9	1.1	1.1	1.0	0.9	0.9	1.0
0.9	0.9	0.9	0.8	0.7	0.6	0.7	0.7	0.7	0.7	0.6	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.7	0.8	0.7	0.8	0.7	0.7	0.8
0.6	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.3	0.2	0.2	0.3	0.5	0.5	0.5	0.4	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.3	0.5	0.5
0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.4	0.4	0.3	0.3	0.1	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.2	0.3
0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.2	0.1	0.0	0.1	0.1	0.2	0.2	0.3	0.2	0.2	0.2	0.0	0.1	0.2	0.3	0.2	0.2	0.1	0.2	0.2	0.1	0.1	0.0	0.1	0.1	0.1
0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.3	0.3	0.1	0.1	0.2	0.3	0.4	0.4	0.2	0.3	0.3	0.1	0.1	0.2	0.2	0.1	0.2	0.1	0.2	0.1	-0.1	0.1	0.1	0.1	0.1	0.1
0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.0	0.1	0.2	0.3	0.4	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.0	0.2	0.2	0.1	0.1	0.1	0.2	0.1	0.0
0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.1	0.2	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.2	0.2
0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.5	0.3	0.4	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.3
0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.8	0.7	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.8	0.9	0.8	0.7	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.9	1.0	1.0	0.9	0.9	0.8	0.7	0.8	0.8	0.9	0.8	0.8	0.8
1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.0	0.9	1.0	1.0	1.0	0.9	0.9	0.9
1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.0	1.0	1.0
1.3	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.6	1.6	1.6	1.5	1.5	1.5	1.4	1.4	1.4	1.3

Figure 48. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS4 (400 hPa)
NOAA16, using all observations



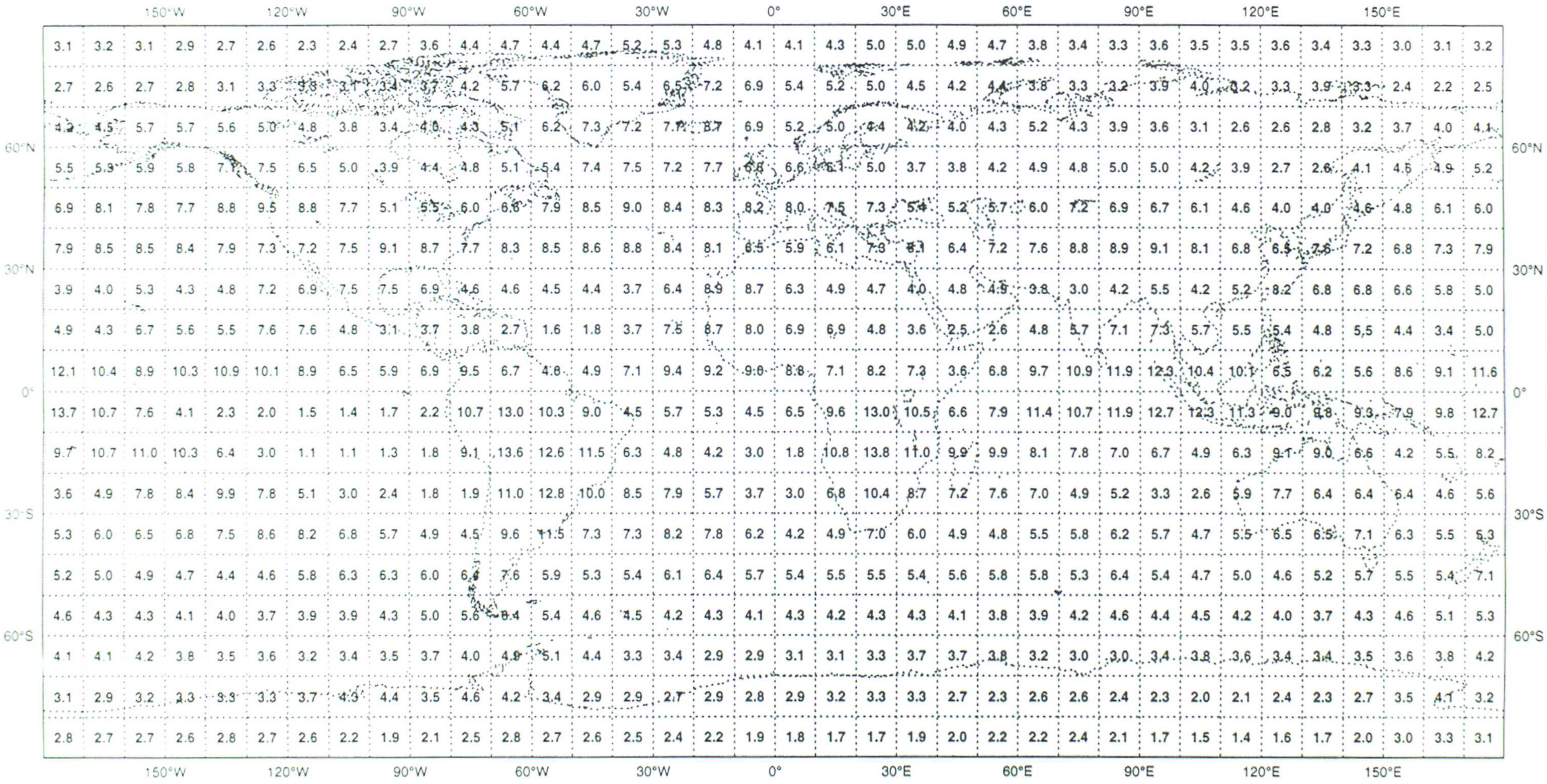
0.6	0.6	0.6	0.7	0.7	0.7	0.6	0.6	0.7	0.8	1.0	1.1	1.1	1.2	1.4	1.5	1.5	1.4	1.4	1.3	1.7	1.7	1.6	1.5	1.3	1.3	1.2	1.2	1.1	1.0	0.9	0.8	0.8	0.7	0.7	0.7
0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.8	0.9	1.2	1.4	1.7	1.7	1.8	2.2	2.2	1.8	1.7	1.5	1.3	1.3	1.8	1.2	1.1	1.0	1.2	1.2	1.0	1.0	1.0	0.9	0.8	0.7	0.7
0.7	0.8	1.1	1.1	1.1	1.2	1.1	1.0	1.0	1.0	1.0	1.2	1.2	1.6	1.7	2.0	2.4	2.1	1.5	1.2	1.1	1.2	1.2	1.3	1.4	1.3	1.2	1.1	1.0	0.8	0.7	0.7	0.6	0.6	0.6	0.7
0.9	0.9	1.1	0.9	1.2	1.6	1.5	1.4	1.0	1.0	1.1	1.3	1.2	1.8	2.0	1.7	1.9	1.9	1.6	1.3	1.2	1.0	1.3	1.2	1.2	1.4	1.1	0.9	0.7	0.7	0.5	0.6	0.5	0.5	0.7	0.8
1.4	1.7	1.8	1.6	1.7	2.0	2.1	2.0	1.3	1.2	1.5	1.6	2.0	2.3	2.1	2.0	2.0	2.0	2.0	1.7	1.8	1.4	1.3	1.3	1.2	1.4	1.4	1.3	1.2	0.9	0.9	0.9	0.9	0.9	1.3	1.2
2.0	2.0	2.1	2.1	1.6	1.6	1.7	1.8	2.2	2.0	2.0	2.4	2.3	2.2	2.0	2.1	1.9	1.6	1.2	1.1	1.4	1.2	1.3	1.6	1.5	1.5	1.6	1.6	1.4	1.4	1.6	2.0	1.6	1.7	1.7	1.9
0.9	0.8	1.3	1.0	1.1	2.0	1.7	1.9	1.9	1.6	1.1	1.2	1.3	1.2	1.2	1.5	2.4	2.4	1.5	1.2	1.4	0.9	1.2	1.4	0.9	0.7	1.0	1.6	1.0	1.1	2.2	1.8	2.1	2.2	1.6	1.3
1.8	1.5	2.2	1.9	1.8	2.5	2.4	1.4	1.0	1.2	1.1	0.9	0.5	0.5	1.1	2.3	2.5	2.4	1.9	1.9	1.3	1.0	0.7	0.8	1.6	2.0	2.3	2.5	2.0	2.0	1.7	1.5	2.2	1.6	1.2	1.9
4.4	3.8	3.3	3.6	3.6	3.4	2.9	1.9	1.7	2.2	3.3	2.4	1.5	1.5	2.2	3.0	3.0	2.9	2.9	2.4	3.0	2.4	1.0	2.2	3.5	3.8	4.5	4.6	3.9	3.7	2.2	2.2	2.0	3.1	3.3	4.2
5.3	4.0	2.8	1.6	0.9	0.8	0.7	0.7	0.6	0.8	3.9	4.8	3.7	3.0	1.4	1.7	1.7	1.4	2.3	3.3	4.7	3.7	2.2	2.7	4.0	3.8	4.4	4.9	4.5	4.2	3.2	3.4	3.2	2.8	3.7	4.8
3.4	3.9	3.7	3.4	1.8	0.9	0.5	0.4	0.4	0.7	3.2	4.8	4.3	4.2	2.1	1.4	1.2	0.9	0.6	3.6	5.0	3.9	3.4	3.5	2.9	2.8	2.8	2.7	1.9	2.5	3.2	3.0	2.1	1.4	2.1	2.9
1.0	1.2	2.0	2.4	2.8	2.2	1.7	1.0	0.7	0.6	0.6	3.7	4.5	3.3	2.6	2.3	1.5	0.9	0.8	2.0	3.0	2.6	2.1	2.3	2.4	1.5	1.6	0.9	0.7	1.5	2.3	1.9	1.8	1.7	1.2	1.8
1.2	1.4	1.7	1.8	2.1	2.3	2.3	1.9	1.4	1.3	1.0	2.4	3.6	1.9	2.0	2.3	1.9	1.5	0.9	1.2	1.7	1.5	1.2	1.2	1.5	1.4	1.5	1.3	1.1	1.4	1.8	1.7	2.0	1.6	1.2	1.1
1.3	1.2	1.0	1.0	1.0	1.0	1.5	1.5	1.7	1.5	1.5	1.8	1.3	1.2	1.2	1.5	1.6	1.4	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.3	1.6	1.4	1.2	1.2	1.0	1.1	1.5	1.3	1.1	1.5
1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.8	1.0	1.3	1.5	1.2	1.0	1.1	0.9	0.9	1.0	1.0	0.9	1.0	1.0	1.0	0.9	0.8	1.0	1.1	1.0	1.1	1.0	0.8	0.8	1.0	1.2	1.1	1.1
0.9	0.9	0.9	0.7	0.7	0.6	0.6	0.5	0.5	0.6	0.7	0.9	1.0	1.1	0.7	0.7	0.5	0.6	0.6	0.5	0.5	0.6	0.6	0.7	0.6	0.5	0.5	0.6	0.9	0.9	0.7	0.8	0.8	0.8	0.8	0.9
0.6	0.5	0.4	0.6	0.5	0.4	0.5	0.5	0.6	0.5	0.7	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.5	0.5	0.5	0.6
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4

Figure 49. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations



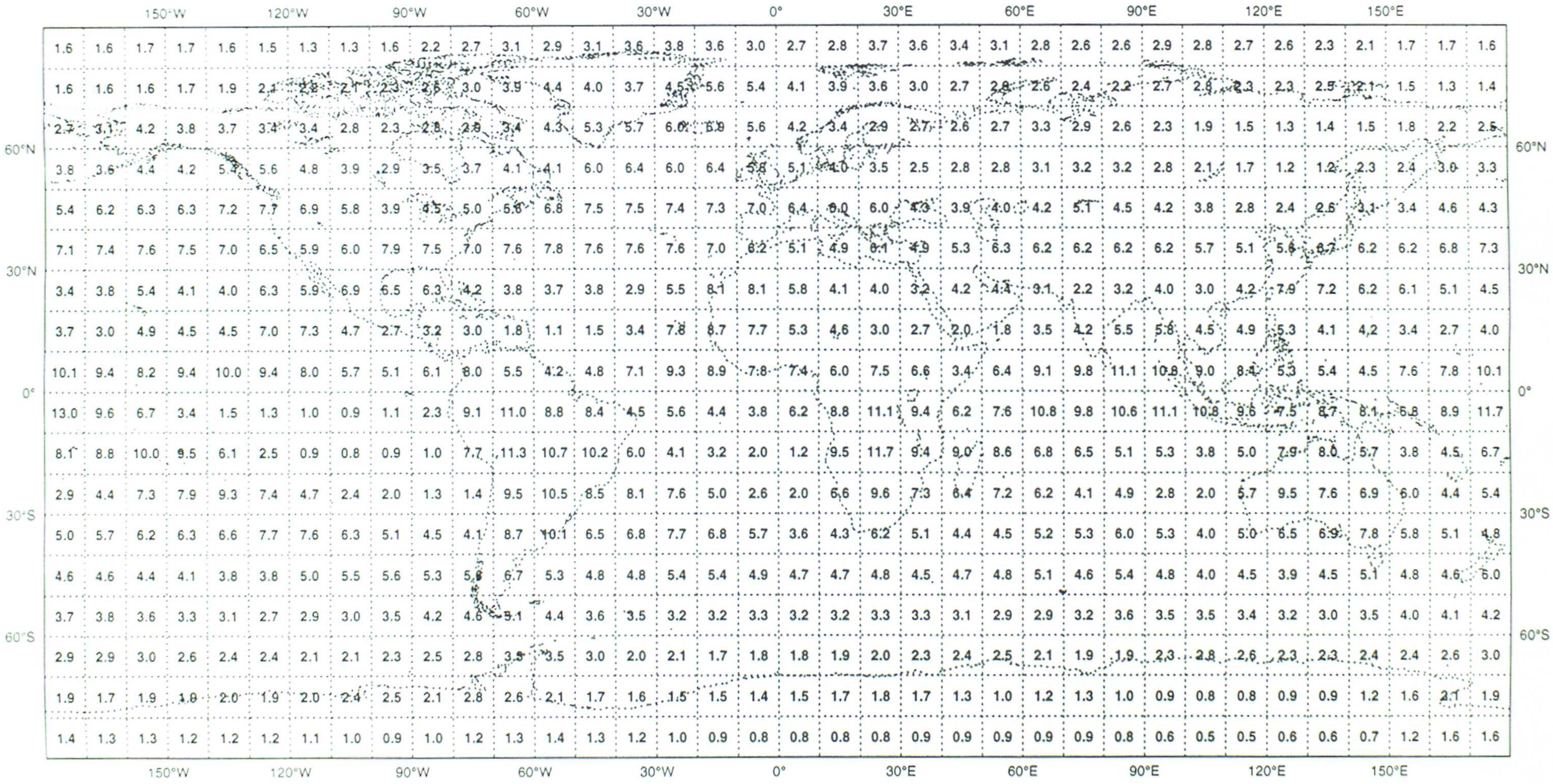
5.3	5.2	5.2	5.0	5.0	4.8	4.3	4.4	5.0	7.4	9.8	8.3	8.6	9.2	10.1	10.2	8.1	7.3	7.4	7.9	8.6	8.1	7.9	7.4	6.4	6.0	5.7	6.4	6.6	6.3	6.4	6.0	5.6	5.1	5.3	5.5
5.2	5.0	5.2	5.4	5.3	5.8	5.4	5.6	6.6	6.9	8.4	10.1	11.8	8.8	7.5	11.3	12.6	12.9	11.2	10.8	10.1	9.1	8.4	8.2	7.3	6.3	6.0	6.8	6.7	6.3	6.3	6.5	6.0	4.6	4.5	4.9
9.0	9.3	11.3	10.9	10.0	8.9	8.1	6.6	5.9	6.9	8.1	9.9	12.5	13.2	14.4	14.8	16.1	13.5	12.2	10.1	8.0	7.9	7.9	7.2	7.8	6.5	6.3	6.1	5.4	4.7	5.9	6.0	6.3	7.4	7.8	8.2
12.3	12.0	13.2	13.1	15.5	14.3	11.2	9.0	7.1	8.3	8.8	9.8	11.3	14.4	15.0	15.0	15.6	12.9	12.9	10.3	9.8	7.1	6.4	6.8	7.7	7.5	8.4	8.6	8.1	7.2	5.3	6.0	10.2	10.2	11.9	11.7
14.7	16.4	16.6	16.5	18.7	19.0	15.8	13.4	9.4	11.2	11.5	18.6	15.3	16.8	18.1	17.8	17.4	16.5	15.7	15.9	14.8	12.4	11.3	11.1	10.5	12.0	11.7	11.6	10.9	8.4	7.8	10.5	10.9	11.2	13.0	13.3
17.1	17.9	17.9	17.5	17.9	16.6	14.7	14.5	17.7	17.1	17.2	17.5	18.2	18.4	18.8	17.8	17.1	15.8	14.8	15.1	17.0	14.1	13.8	16.4	15.7	14.7	14.0	13.7	13.7	13.1	14.7	16.6	16.5	15.8	16.5	17.6
9.2	10.5	13.0	10.9	10.9	14.7	15.2	16.9	15.9	15.8	11.3	10.1	10.0	10.3	8.2	14.0	19.4	19.7	16.1	12.2	11.5	9.5	11.3	11.4	8.9	7.3	8.6	10.0	8.6	10.9	17.5	16.8	15.4	14.2	12.7	11.3
9.7	7.8	11.9	11.4	11.5	15.9	16.8	12.2	7.4	8.5	8.0	5.5	3.8	4.4	8.4	18.1	21.1	19.9	14.8	13.0	9.7	8.4	6.3	5.0	9.1	11.2	13.5	13.9	11.0	11.5	12.4	9.8	10.3	8.7	7.3	9.9
21.5	19.7	18.0	19.9	20.7	19.6	17.1	12.7	11.4	14.0	17.3	12.9	10.3	11.9	16.4	20.4	19.9	18.2	17.3	14.7	17.9	15.3	9.3	14.5	19.3	21.2	23.2	22.9	19.7	18.4	12.5	11.9	11.1	16.1	17.5	21.5
25.9	20.6	15.8	8.3	4.3	3.9	3.6	3.5	3.8	6.3	19.0	23.2	19.2	19.0	11.1	13.0	10.7	9.4	14.2	19.3	23.6	20.2	14.2	17.0	22.7	21.4	22.7	24.2	23.0	20.7	16.7	18.9	17.8	15.6	18.9	23.8
17.6	19.2	21.5	20.2	14.0	6.9	4.2	4.1	4.0	4.2	16.4	23.9	23.5	22.6	14.6	10.5	8.5	5.7	3.9	22.2	25.0	21.0	19.9	19.1	15.8	15.0	12.7	12.0	9.4	11.9	18.6	19.0	13.8	9.1	10.7	14.8
7.5	10.9	16.9	18.3	21.1	18.0	11.8	6.9	6.5	5.3	5.6	21.2	23.2	19.4	18.6	18.2	13.2	7.6	5.7	16.6	22.7	16.8	15.3	16.8	14.4	10.7	11.6	7.7	6.2	15.2	24.6	20.8	17.7	14.4	10.9	12.6
12.6	14.1	14.8	15.2	15.7	18.1	17.3	15.2	13.1	11.8	11.5	21.1	22.5	16.2	16.1	18.0	17.1	14.5	10.2	11.5	15.5	12.8	11.5	11.4	12.4	13.4	14.6	12.9	10.4	13.2	16.2	17.4	20.1	14.8	13.0	13.0
12.3	12.1	11.9	11.0	10.5	10.7	12.5	13.6	13.7	13.8	15.3	18.4	14.4	13.2	12.8	13.2	13.9	12.4	12.0	12.3	12.2	11.6	11.7	12.1	12.8	12.0	13.5	12.4	11.2	11.5	10.9	12.2	13.0	12.8	13.1	15.6
10.7	10.9	10.8	9.9	9.8	8.9	9.5	9.9	10.8	12.0	13.0	14.6	12.2	10.3	9.9	9.3	9.4	9.0	9.1	8.7	8.5	8.7	8.6	8.6	9.1	9.6	9.9	10.4	10.1	9.6	9.6	9.8	10.7	11.0	11.9	12.5
9.1	8.9	8.9	8.5	8.0	8.0	7.5	8.0	8.3	8.7	9.0	10.1	10.0	8.3	6.7	6.9	6.4	6.8	6.9	7.3	7.5	8.4	9.3	9.4	8.7	7.9	7.7	8.5	8.8	8.3	8.2	8.7	8.9	8.3	8.5	9.1
7.0	6.2	7.1	7.8	8.4	8.3	8.1	9.0	9.1	7.8	9.9	9.3	7.6	7.0	7.0	7.1	7.0	6.6	6.3	6.6	6.8	6.2	4.7	4.2	5.6	5.5	4.0	3.8	3.5	3.9	4.4	4.2	5.0	6.8	8.3	7.8
6.4	5.6	5.6	5.5	5.5	5.5	4.9	4.1	3.8	4.5	5.4	5.9	6.0	5.7	5.2	4.6	4.1	3.4	3.3	3.1	3.2	3.4	3.5	3.5	3.4	3.6	3.2	2.7	2.4	2.4	2.7	2.8	3.1	5.3	7.3	7.0

Figure 50. ATOVS SD O-B brightness temperature differences (deg C). **DECEMBER 2002**
Channel: AMSUA-5 (700 hPa)
NOAA16, using all observations



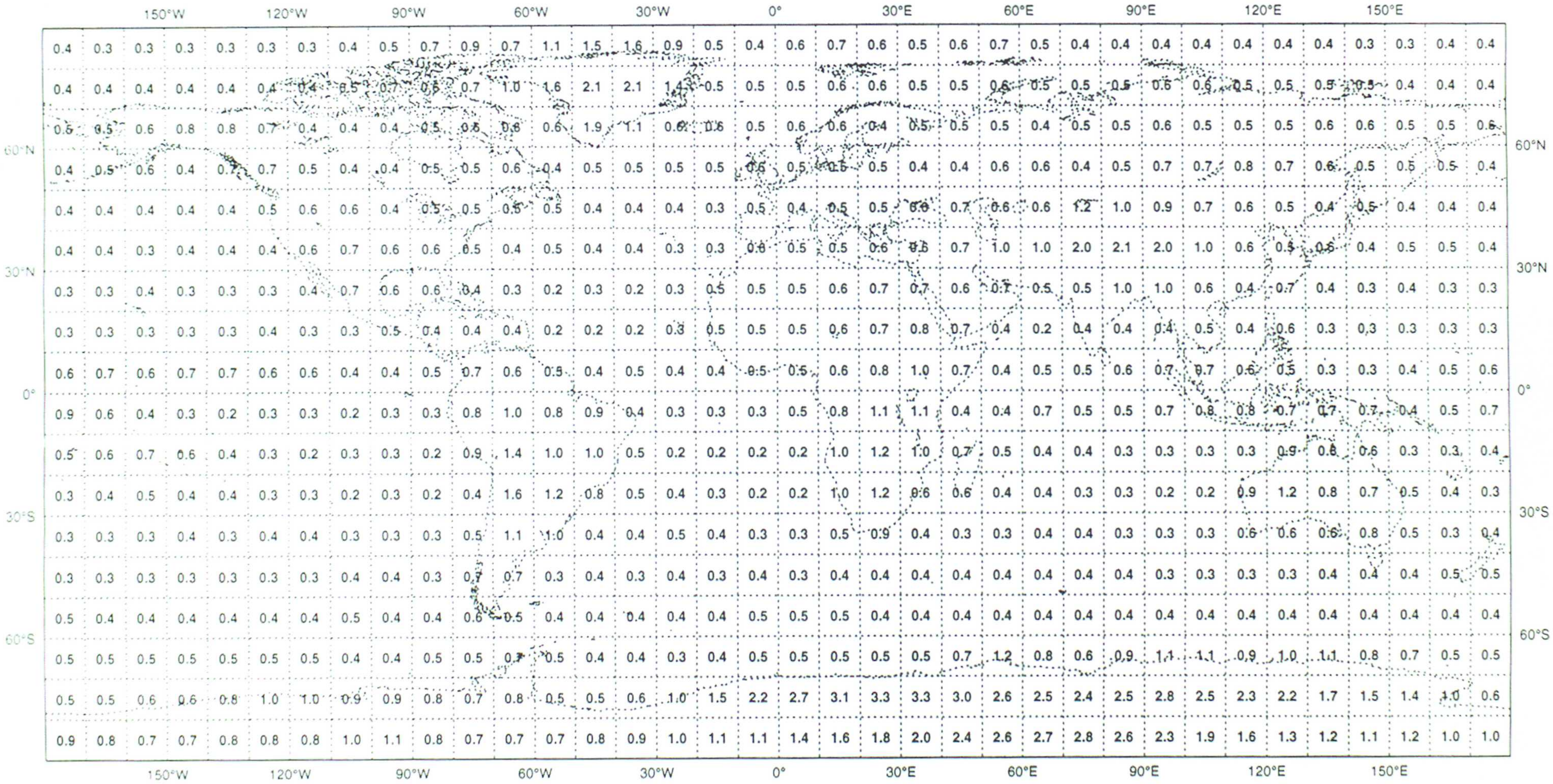
3.1	3.2	3.1	2.9	2.7	2.6	2.3	2.4	2.7	3.6	4.4	4.7	4.4	4.7	5.2	5.3	4.8	4.1	4.1	4.3	5.0	5.0	4.9	4.7	3.8	3.4	3.3	3.6	3.5	3.5	3.6	3.4	3.3	3.0	3.1	3.2
2.7	2.6	2.7	2.8	3.1	3.3	3.8	3.1	3.4	3.7	4.2	5.7	6.2	6.0	5.4	6.5	7.2	6.9	5.4	5.2	5.0	4.5	4.2	4.4	3.8	3.3	3.2	3.9	4.0	3.2	3.3	3.9	3.3	2.4	2.2	2.5
4.2	4.5	5.7	5.7	5.6	5.0	4.8	3.8	3.4	4.0	4.3	5.1	6.2	7.3	7.2	7.1	8.7	6.9	5.2	5.0	4.4	4.2	4.0	4.3	5.2	4.3	3.9	3.6	3.1	2.6	2.6	2.8	3.2	3.7	4.0	4.1
5.5	5.9	5.9	5.8	7.1	7.5	6.5	5.0	3.9	4.4	4.8	5.1	5.4	7.4	7.5	7.2	7.7	6.8	6.6	6.1	5.0	3.7	3.8	4.2	4.9	4.8	5.0	5.0	4.2	3.9	2.7	2.6	4.1	4.6	4.9	5.2
6.9	8.1	7.8	7.7	8.8	9.5	8.8	7.7	5.1	5.5	6.0	6.6	7.9	8.5	9.0	8.4	8.3	8.2	8.0	7.5	7.3	5.4	5.2	5.7	6.0	7.2	6.9	6.7	6.1	4.6	4.0	4.0	4.6	4.8	6.1	6.0
7.9	8.5	8.5	8.4	7.9	7.3	7.2	7.5	9.1	8.7	7.7	8.3	8.5	8.6	8.8	8.4	8.1	6.5	5.9	6.1	7.3	8.1	6.4	7.2	7.6	8.8	8.9	9.1	8.1	6.8	6.5	7.6	7.2	6.8	7.3	7.9
3.9	4.0	5.3	4.3	4.8	7.2	6.9	7.5	7.5	6.9	4.6	4.6	4.5	4.4	3.7	6.4	8.9	8.7	6.3	4.9	4.7	4.0	4.8	4.9	3.8	3.0	4.2	5.5	4.2	5.2	8.2	6.8	6.8	6.6	5.8	5.0
4.9	4.3	6.7	5.6	5.5	7.6	7.6	4.8	3.1	3.7	3.8	2.7	1.6	1.8	3.7	7.5	8.7	8.0	6.9	6.9	4.8	3.6	2.5	2.6	4.8	5.7	7.1	7.3	5.7	5.5	5.4	4.8	5.5	4.4	3.4	5.0
12.1	10.4	8.9	10.3	10.9	10.1	8.9	6.5	5.9	6.9	9.5	6.7	4.8	4.9	7.1	9.4	9.2	9.6	8.8	7.1	8.2	7.3	3.6	6.8	9.7	10.9	11.9	12.3	10.4	10.1	6.5	6.2	5.6	8.6	9.1	11.6
13.7	10.7	7.6	4.1	2.3	2.0	1.5	1.4	1.7	2.2	10.7	13.0	10.3	9.0	4.5	5.7	5.3	4.5	6.5	9.6	13.0	10.5	6.6	7.9	11.4	10.7	11.9	12.7	12.3	11.3	9.0	8.8	9.3	7.9	9.8	12.7
9.7	10.7	11.0	10.3	6.4	3.0	1.1	1.1	1.3	1.8	9.1	13.6	12.6	11.5	6.3	4.8	4.2	3.0	1.8	10.8	13.8	11.0	9.9	9.9	8.1	7.8	7.0	6.7	4.9	6.3	9.1	9.0	6.6	4.2	5.5	8.2
3.6	4.9	7.8	8.4	9.9	7.8	5.1	3.0	2.4	1.8	1.9	11.0	12.8	10.0	8.5	7.9	5.7	3.7	3.0	6.8	10.4	8.7	7.2	7.6	7.0	4.9	5.2	3.3	2.6	5.9	7.7	6.4	6.4	6.4	4.6	5.6
5.3	6.0	6.5	6.8	7.5	8.6	8.2	6.8	5.7	4.9	4.5	9.6	11.5	7.3	7.3	8.2	7.8	6.2	4.2	4.9	7.0	6.0	4.9	4.8	5.5	5.8	6.2	5.7	4.7	5.5	6.5	6.5	7.1	6.3	5.5	5.3
5.2	5.0	4.9	4.7	4.4	4.6	5.8	6.3	6.3	6.0	6.4	7.6	5.9	5.3	5.4	6.1	6.4	5.7	5.4	5.5	5.5	5.4	5.6	5.8	5.8	5.3	6.4	5.4	4.7	5.0	4.6	5.2	5.7	5.5	5.4	7.1
4.6	4.3	4.3	4.1	4.0	3.7	3.9	3.9	4.3	5.0	5.6	8.4	5.4	4.6	4.5	4.2	4.3	4.1	4.3	4.2	4.3	4.3	4.1	3.8	3.9	4.2	4.6	4.4	4.5	4.2	4.0	3.7	4.3	4.6	5.1	5.3
4.1	4.1	4.2	3.8	3.5	3.6	3.2	3.4	3.5	3.7	4.0	4.9	5.1	4.4	3.3	3.4	2.9	2.9	3.1	3.1	3.3	3.7	3.7	3.8	3.2	3.0	3.0	3.4	3.8	3.6	3.4	3.4	3.5	3.6	3.8	4.2
3.1	2.9	3.2	3.3	3.3	3.3	3.7	4.3	4.4	3.5	4.6	4.2	3.4	2.9	2.9	2.7	2.9	2.8	2.9	3.2	3.3	3.3	2.7	2.3	2.6	2.6	2.4	2.3	2.0	2.1	2.4	2.3	2.7	3.5	4.1	3.2
2.8	2.7	2.7	2.6	2.8	2.7	2.6	2.2	1.9	2.1	2.5	2.8	2.7	2.6	2.5	2.4	2.2	1.9	1.8	1.7	1.7	1.9	2.0	2.2	2.2	2.4	2.1	1.7	1.5	1.4	1.6	1.7	2.0	3.0	3.3	3.1

Figure 51. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations



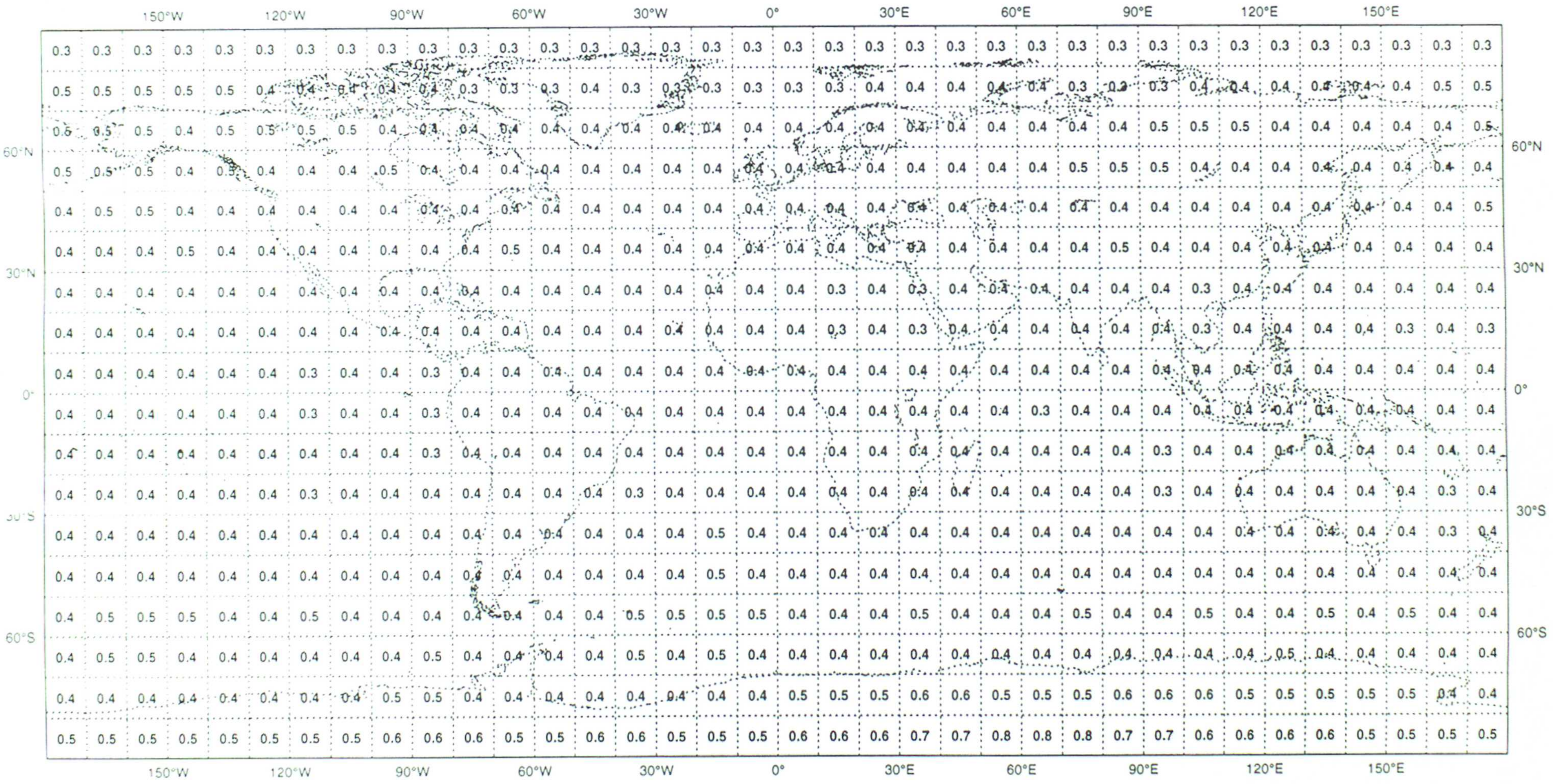
1.6	1.6	1.7	1.7	1.6	1.5	1.3	1.3	1.6	2.2	2.7	3.1	2.9	3.1	3.6	3.8	3.6	3.0	2.7	2.8	3.7	3.6	3.4	3.1	2.8	2.6	2.6	2.9	2.8	2.7	2.6	2.3	2.1	1.7	1.7	1.6
1.6	1.6	1.6	1.7	1.9	2.1	2.2	2.1	2.3	2.6	3.0	3.9	4.4	4.0	3.7	4.5	5.6	5.4	4.1	3.9	3.6	3.0	2.7	2.8	2.6	2.4	2.2	2.7	2.8	2.3	2.3	2.5	2.1	1.5	1.3	1.4
2.7	3.1	4.2	3.8	3.7	3.4	3.4	2.8	2.3	2.8	2.9	3.4	4.3	5.3	5.7	6.0	5.9	5.6	4.2	3.4	2.9	2.7	2.6	2.7	3.3	2.9	2.6	2.3	1.9	1.5	1.3	1.4	1.5	1.8	2.2	2.5
3.8	3.6	4.4	4.2	5.4	5.6	4.8	3.9	2.9	3.5	3.7	4.1	4.1	6.0	6.4	6.0	6.4	5.8	5.1	4.0	3.5	2.5	2.8	2.8	3.1	3.2	3.2	2.8	2.1	1.7	1.2	1.2	2.3	2.4	3.0	3.3
5.4	6.2	6.3	6.3	7.2	7.7	6.9	5.8	3.9	4.5	5.0	5.6	6.8	7.5	7.5	7.4	7.3	7.0	6.4	6.0	6.0	4.3	3.9	4.0	4.2	5.1	4.5	4.2	3.8	2.8	2.4	2.6	3.1	3.4	4.6	4.3
7.1	7.4	7.6	7.5	7.0	6.5	5.9	6.0	7.9	7.5	7.0	7.6	7.8	7.6	7.6	7.6	7.0	6.2	5.1	4.9	6.1	4.9	5.3	6.3	6.2	6.2	6.2	6.2	5.7	5.1	5.6	6.7	6.2	6.2	6.8	7.3
3.4	3.8	5.4	4.1	4.0	6.3	5.9	6.9	6.5	6.3	4.2	3.8	3.7	3.8	2.9	5.5	8.1	8.1	5.8	4.1	4.0	3.2	4.2	4.4	3.1	2.2	3.2	4.0	3.0	4.2	7.9	7.2	6.2	6.1	5.1	4.5
3.7	3.0	4.9	4.5	4.5	7.0	7.3	4.7	2.7	3.2	3.0	1.8	1.1	1.5	3.4	7.8	8.7	7.7	5.3	4.6	3.0	2.7	2.0	1.8	3.5	4.2	5.5	5.8	4.5	4.9	5.3	4.1	4.2	3.4	2.7	4.0
10.1	9.4	8.2	9.4	10.0	9.4	8.0	5.7	5.1	6.1	8.0	5.5	4.2	4.8	7.1	9.3	8.9	7.8	7.4	6.0	7.5	6.6	3.4	6.4	9.1	9.8	11.1	10.8	9.0	8.4	5.3	5.4	4.5	7.6	7.8	10.1
13.0	9.6	6.7	3.4	1.5	1.3	1.0	0.9	1.1	2.3	9.1	11.0	8.8	8.4	4.5	5.6	4.4	3.8	6.2	8.8	11.1	9.4	6.2	7.6	10.8	9.8	10.6	11.1	10.8	9.6	7.5	8.7	8.1	6.8	8.9	11.7
8.1	8.8	10.0	9.5	6.1	2.5	0.9	0.8	0.9	1.0	7.7	11.3	10.7	10.2	6.0	4.1	3.2	2.0	1.2	9.5	11.7	9.4	9.0	8.6	6.8	6.5	5.1	5.3	3.8	5.0	7.9	8.0	5.7	3.8	4.5	6.7
2.9	4.4	7.3	7.9	9.3	7.4	4.7	2.4	2.0	1.3	1.4	9.5	10.5	8.5	8.1	7.6	5.0	2.6	2.0	6.6	9.6	7.3	6.4	7.2	6.2	4.1	4.9	2.8	2.0	5.7	9.5	7.6	6.9	6.0	4.4	5.4
5.0	5.7	6.2	6.3	6.6	7.7	7.6	6.3	5.1	4.5	4.1	8.7	10.1	6.5	6.8	7.7	6.8	5.7	3.6	4.3	6.2	5.1	4.4	4.5	5.2	5.3	6.0	5.3	4.0	5.0	6.5	6.9	7.8	5.8	5.1	4.8
4.6	4.6	4.4	4.1	3.8	3.8	5.0	5.5	5.6	5.3	5.6	6.7	5.3	4.8	4.8	5.4	5.4	4.9	4.7	4.7	4.8	4.5	4.7	4.8	5.1	4.6	5.4	4.8	4.0	4.5	3.9	4.5	5.1	4.8	4.6	6.0
3.7	3.8	3.6	3.3	3.1	2.7	2.9	3.0	3.5	4.2	4.6	5.1	4.4	3.6	3.5	3.2	3.2	3.3	3.2	3.2	3.3	3.3	3.1	2.9	2.9	3.2	3.6	3.5	3.5	3.4	3.2	3.0	3.5	4.0	4.1	4.2
2.9	2.9	3.0	2.6	2.4	2.4	2.1	2.1	2.3	2.5	2.8	3.5	3.5	3.0	2.0	2.1	1.7	1.8	1.8	1.9	2.0	2.3	2.4	2.5	2.1	1.9	1.9	2.3	2.8	2.6	2.3	2.3	2.4	2.4	2.6	3.0
1.9	1.7	1.9	1.8	2.0	1.9	2.0	2.4	2.5	2.1	2.8	2.6	2.1	1.7	1.6	1.5	1.5	1.4	1.5	1.7	1.8	1.7	1.3	1.0	1.2	1.3	1.0	0.9	0.8	0.8	0.9	0.9	1.2	1.6	2.1	1.9
1.4	1.3	1.3	1.2	1.2	1.2	1.1	1.0	0.9	1.0	1.2	1.3	1.4	1.3	1.2	1.0	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.6	0.5	0.5	0.6	0.6	0.7	1.2	1.6	1.6

Figure 52. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-7 (300 hPa)
NOAA16, using all observations



0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.7	0.9	0.7	1.1	1.5	1.6	0.9	0.5	0.4	0.6	0.7	0.6	0.5	0.6	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.7	0.6	0.7	1.0	1.6	2.1	2.1	1.4	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4
0.6	0.5	0.6	0.8	0.8	0.7	0.4	0.4	0.4	0.5	0.6	0.8	0.6	1.9	1.1	0.6	0.6	0.5	0.6	0.6	0.4	0.5	0.5	0.5	0.4	0.5	0.5	0.6	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.6
0.4	0.5	0.6	0.4	0.7	0.7	0.5	0.4	0.4	0.5	0.5	0.6	0.4	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.6	0.6	0.4	0.5	0.7	0.7	0.8	0.7	0.6	0.5	0.5	0.5	0.4
0.4	0.4	0.4	0.4	0.4	0.5	0.6	0.6	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.5	0.4	0.5	0.5	0.6	0.7	0.6	0.6	1.2	1.0	0.9	0.7	0.6	0.5	0.4	0.5	0.4	0.4	0.4
0.4	0.4	0.3	0.4	0.4	0.4	0.6	0.7	0.6	0.6	0.5	0.4	0.5	0.4	0.4	0.3	0.3	0.6	0.5	0.5	0.6	0.5	0.7	1.0	1.0	2.0	2.1	2.0	1.0	0.6	0.5	0.6	0.4	0.5	0.5	0.4
0.3	0.3	0.4	0.3	0.3	0.3	0.4	0.7	0.6	0.6	0.4	0.3	0.2	0.3	0.2	0.3	0.5	0.5	0.5	0.6	0.7	0.7	0.6	0.7	0.5	0.5	1.0	1.0	0.6	0.4	0.7	0.4	0.3	0.4	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.5	0.4	0.4	0.4	0.2	0.2	0.2	0.3	0.5	0.5	0.5	0.6	0.7	0.8	0.7	0.4	0.2	0.4	0.4	0.4	0.5	0.4	0.6	0.3	0.3	0.3	0.3	0.3
0.6	0.7	0.6	0.7	0.7	0.6	0.6	0.4	0.4	0.5	0.7	0.6	0.5	0.4	0.5	0.4	0.4	0.5	0.5	0.6	0.8	1.0	0.7	0.4	0.5	0.5	0.6	0.7	0.7	0.6	0.5	0.3	0.3	0.4	0.5	0.6
0.9	0.6	0.4	0.3	0.2	0.3	0.3	0.2	0.3	0.3	0.8	1.0	0.8	0.9	0.4	0.3	0.3	0.3	0.5	0.8	1.1	1.1	0.4	0.4	0.7	0.5	0.5	0.7	0.8	0.8	0.7	0.7	0.7	0.4	0.5	0.7
0.5	0.6	0.7	0.6	0.4	0.3	0.2	0.3	0.3	0.2	0.9	1.4	1.0	1.0	0.5	0.2	0.2	0.2	0.2	1.0	1.2	1.0	0.7	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.9	0.8	0.6	0.3	0.3	0.4
0.3	0.4	0.5	0.4	0.4	0.3	0.3	0.2	0.3	0.2	0.4	1.6	1.2	0.8	0.5	0.4	0.3	0.2	0.2	1.0	1.2	0.6	0.6	0.4	0.4	0.3	0.3	0.2	0.2	0.9	1.2	0.8	0.7	0.5	0.4	0.3
0.3	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.3	0.3	0.5	1.1	1.0	0.4	0.4	0.5	0.4	0.3	0.3	0.5	0.9	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.6	0.6	0.6	0.8	0.5	0.3	0.4
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.7	0.7	0.3	0.4	0.3	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5
0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.7	0.5	0.4	0.4	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.7	1.2	0.8	0.6	0.9	1.1	1.1	0.9	1.0	1.1	0.8	0.7	0.5	0.5
0.5	0.5	0.6	0.6	0.8	1.0	1.0	0.9	0.9	0.8	0.7	0.8	0.5	0.5	0.6	1.0	1.5	2.2	2.7	3.1	3.3	3.3	3.0	2.6	2.5	2.4	2.5	2.8	2.5	2.3	2.2	1.7	1.5	1.4	1.0	0.6
0.9	0.8	0.7	0.7	0.8	0.8	0.8	1.0	1.1	0.8	0.7	0.7	0.7	0.8	0.9	1.0	1.1	1.1	1.4	1.6	1.8	2.0	2.4	2.6	2.7	2.8	2.6	2.3	1.9	1.6	1.3	1.2	1.1	1.2	1.0	1.0

Figure 53. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations



0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5
0.6	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.5
0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5
0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.4	0.3
0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.4	0.5	0.4	0.4
0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5

Figure 54. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-9 (100 hPa)
NOAA16, using all observations

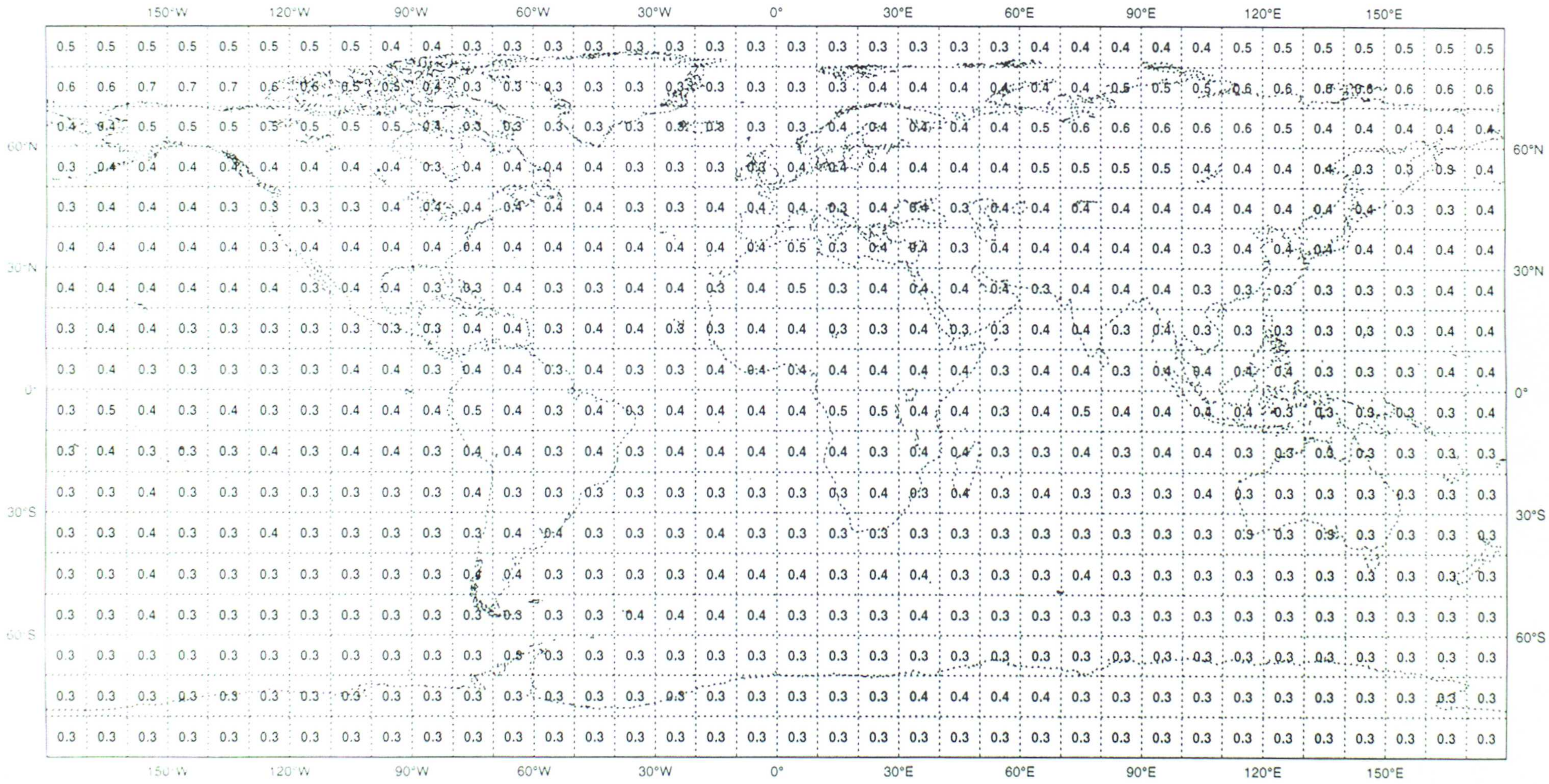
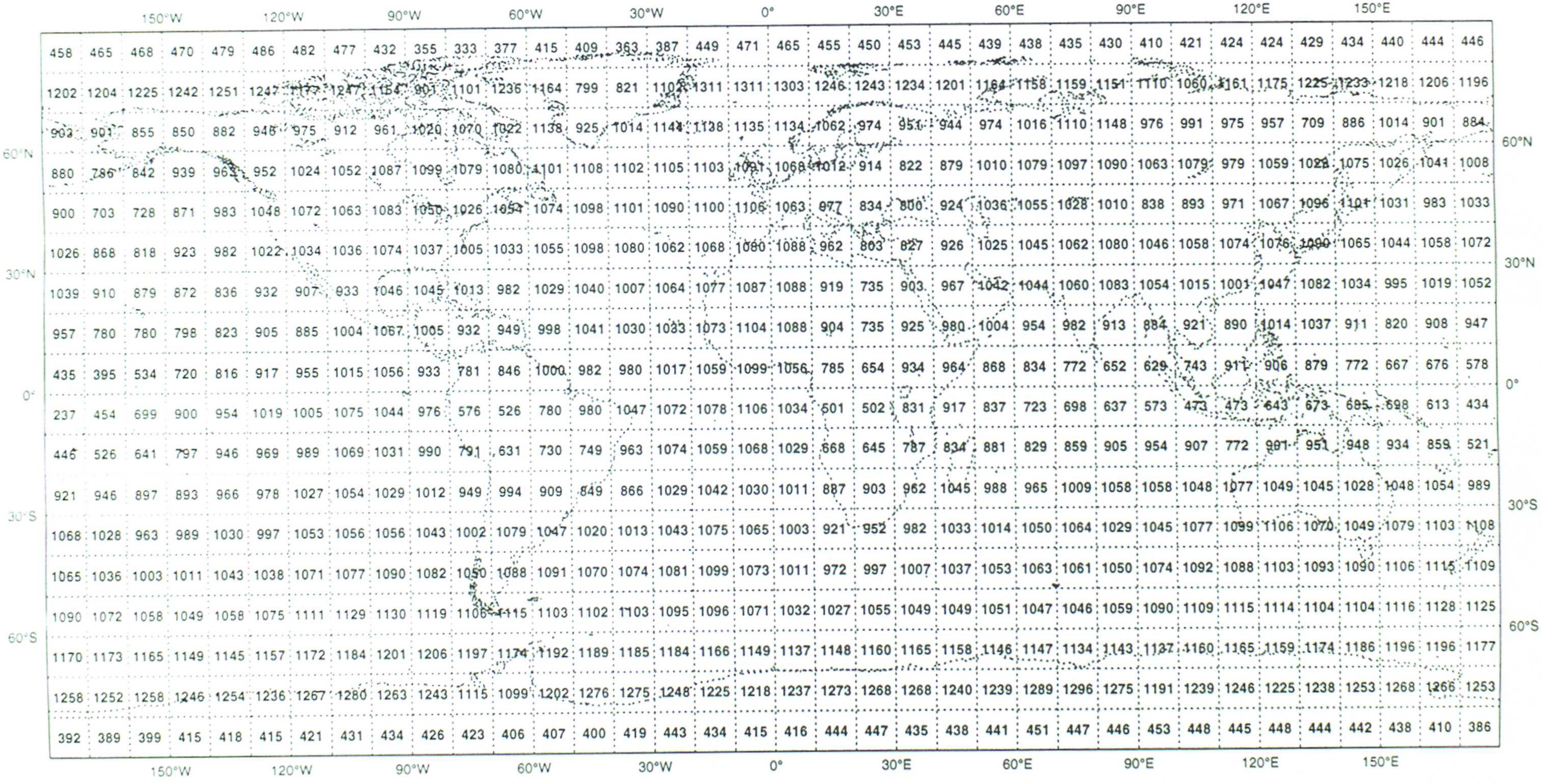

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 55. ATOVS mean daily count. DECEMBER 2002
NOAA17, using all observations
Global average number of observations in 24 hours = 559030



458	465	468	470	479	486	482	477	432	355	333	377	415	409	363	387	449	471	465	455	450	453	445	439	438	435	430	410	421	424	424	429	434	440	444	446
1202	1204	1225	1242	1251	1247	1177	1247	1154	901	1101	1236	1164	799	821	1102	1311	1311	1303	1246	1243	1234	1201	1164	1158	1159	1151	1110	1060	1161	1175	1225	1233	1218	1206	1196
903	901	855	850	882	946	975	912	961	1020	1070	1022	1138	925	1014	1144	1138	1135	1134	1062	974	951	944	974	1016	1110	1148	976	991	975	957	709	886	1014	901	884
880	786	842	939	963	952	1024	1052	1087	1099	1079	1080	1101	1108	1102	1105	1103	1091	1068	1012	914	822	879	1010	1079	1097	1090	1063	1079	979	1059	1028	1075	1026	1041	1008
900	703	728	871	983	1048	1072	1063	1083	1050	1026	1054	1074	1098	1101	1090	1100	1106	1063	977	834	800	924	1036	1055	1028	1010	838	893	971	1067	1096	1101	1031	983	1033
1026	868	818	923	982	1022	1034	1036	1074	1037	1005	1033	1055	1098	1080	1062	1068	1080	1088	962	803	827	926	1025	1045	1062	1080	1046	1058	1074	1076	1090	1065	1044	1058	1072
1039	910	879	872	836	932	907	933	1046	1045	1013	982	1029	1040	1007	1064	1077	1087	1088	919	735	903	967	1042	1044	1060	1083	1054	1015	1001	1047	1082	1034	995	1019	1052
957	780	780	798	823	905	885	1004	1067	1005	932	949	998	1041	1030	1033	1073	1104	1088	904	735	925	980	1004	954	982	913	884	921	890	1014	1037	911	820	908	947
435	395	534	720	816	917	955	1015	1056	933	781	846	1000	982	980	1017	1059	1099	1056	785	654	934	964	868	834	772	652	629	743	911	906	879	772	667	676	578
237	454	699	900	954	1019	1005	1075	1044	976	576	526	780	980	1047	1072	1078	1106	1034	501	502	831	917	837	723	698	637	573	473	473	643	673	685	698	613	434
446	526	641	797	946	969	989	1069	1031	990	791	631	730	749	963	1074	1059	1068	1029	668	645	787	834	881	829	859	905	954	907	772	991	951	948	934	859	521
921	946	897	893	966	978	1027	1054	1029	1012	949	994	909	849	866	1029	1042	1030	1011	887	903	962	1045	988	965	1009	1058	1058	1048	1077	1049	1045	1028	1048	1054	989
1068	1028	963	989	1030	997	1053	1056	1056	1043	1002	1079	1047	1020	1013	1043	1075	1065	1003	921	952	982	1033	1014	1050	1064	1029	1045	1077	1099	1106	1070	1049	1079	1103	1108
1065	1036	1003	1011	1043	1038	1071	1077	1090	1082	1050	1088	1091	1070	1074	1081	1099	1073	1011	972	997	1007	1037	1053	1063	1061	1050	1074	1092	1088	1103	1093	1090	1106	1115	1109
1090	1072	1058	1049	1058	1075	1111	1129	1130	1119	1106	1115	1103	1102	1103	1095	1096	1071	1032	1027	1055	1049	1049	1051	1047	1046	1059	1090	1109	1115	1114	1104	1104	1116	1128	1125
1170	1173	1165	1149	1145	1157	1172	1184	1201	1206	1197	1174	1192	1189	1185	1184	1166	1149	1137	1148	1160	1165	1158	1146	1147	1134	1143	1137	1160	1165	1159	1174	1186	1196	1196	1177
1258	1252	1258	1246	1254	1236	1267	1280	1263	1243	1115	1099	1202	1276	1275	1248	1225	1218	1237	1273	1268	1268	1240	1239	1289	1296	1275	1191	1239	1246	1225	1238	1253	1268	1266	1253
392	389	399	415	418	415	421	431	434	426	423	406	407	400	419	443	434	415	416	444	447	435	438	441	451	447	446	453	448	445	448	444	442	438	410	386

Figure 56. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS8 (Surface)
NOAA17, using all observations

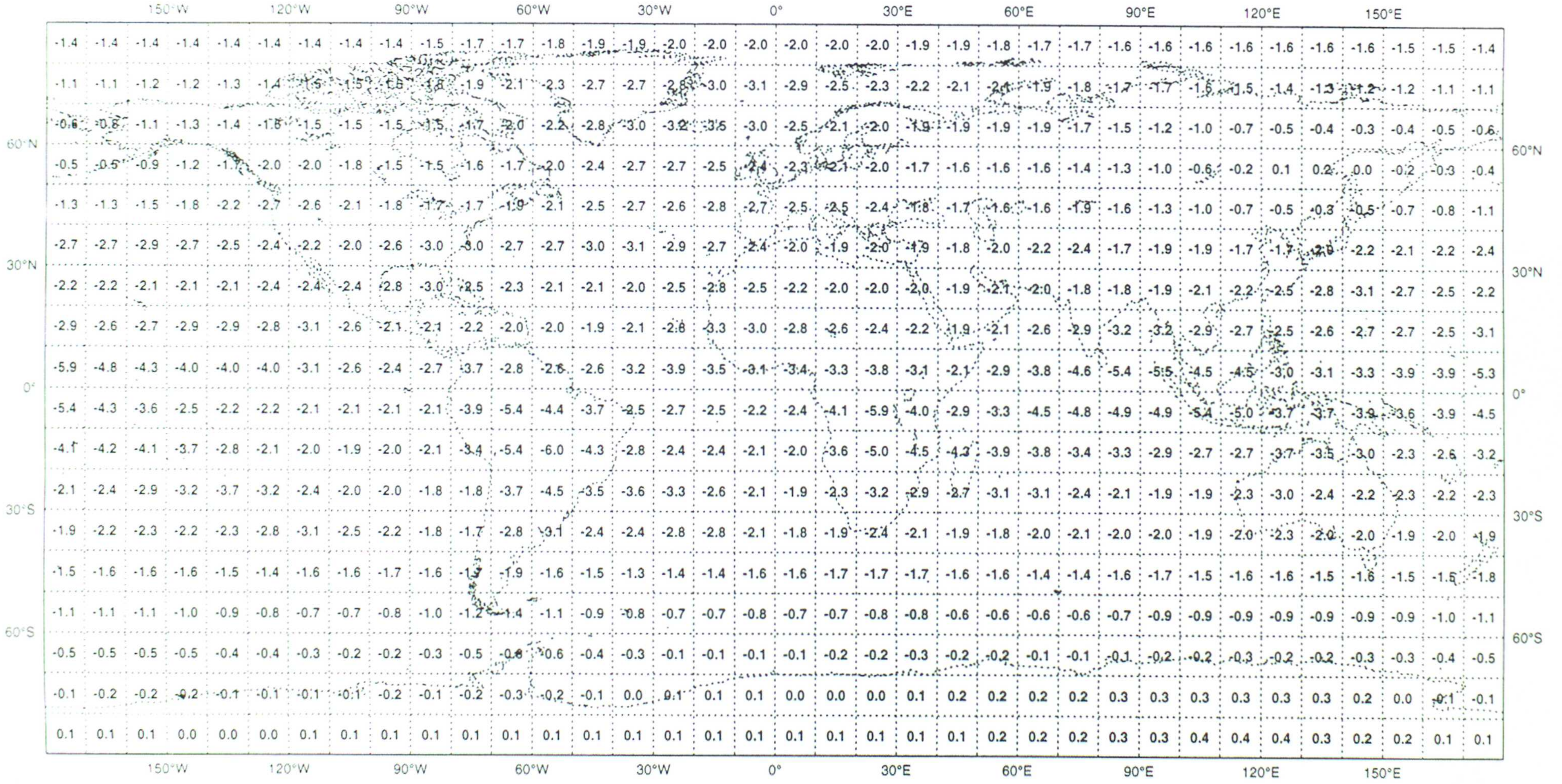

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
-1.4 -1.4 -1.4 -1.4 -1.4 -1.4 -1.4 -1.4 -1.4 -1.5 -1.7 -1.7 -1.8 -1.9 -1.9 -2.0 -2.0 -2.0 -2.0 -2.0 -2.0 -1.9 -1.9 -1.8 -1.7 -1.7 -1.6 -1.6 -1.6 -1.6 -1.6 -1.6 -1.6 -1.5 -1.5 -1.4
-1.1 -1.1 -1.2 -1.2 -1.3 -1.4 -1.5 -1.5 -1.6 -1.8 -1.9 -2.1 -2.3 -2.7 -2.7 -2.8 -3.0 -3.1 -2.9 -2.5 -2.3 -2.2 -2.1 -2.1 -1.9 -1.8 -1.7 -1.7 -1.6 -1.5 -1.4 -1.3 -1.2 -1.2 -1.1 -1.1
-0.6 -0.8 -1.1 -1.3 -1.4 -1.6 -1.5 -1.5 -1.5 -1.5 -1.7 -2.0 -2.2 -2.8 -3.0 -3.2 -3.5 -3.0 -2.5 -2.1 -2.0 -1.9 -1.9 -1.9 -1.9 -1.7 -1.5 -1.2 -1.0 -0.7 -0.5 -0.4 -0.3 -0.4 -0.5 -0.6
-0.5 -0.5 -0.9 -1.2 -1.7 -2.0 -2.0 -1.8 -1.5 -1.5 -1.6 -1.7 -2.0 -2.4 -2.7 -2.7 -2.5 -2.4 -2.3 -2.1 -2.0 -1.7 -1.6 -1.6 -1.6 -1.4 -1.3 -1.0 -0.6 -0.2 0.1 0.2 0.0 -0.2 -0.3 -0.4
-1.3 -1.3 -1.5 -1.8 -2.2 -2.7 -2.6 -2.1 -1.8 -1.7 -1.7 -1.9 -2.1 -2.5 -2.7 -2.6 -2.8 -2.7 -2.5 -2.5 -2.4 -1.8 -1.7 -1.6 -1.6 -1.9 -1.6 -1.3 -1.0 -0.7 -0.5 -0.3 -0.5 -0.7 -0.8 -1.1
-2.7 -2.7 -2.9 -2.7 -2.5 -2.4 -2.2 -2.0 -2.6 -3.0 -3.0 -2.7 -2.7 -3.0 -3.1 -2.9 -2.7 -2.4 -2.0 -1.9 -2.0 -1.9 -1.8 -2.0 -2.2 -2.4 -1.7 -1.9 -1.9 -1.7 -1.7 -2.0 -2.2 -2.1 -2.2 -2.4
-2.2 -2.2 -2.1 -2.1 -2.1 -2.4 -2.4 -2.4 -2.8 -3.0 -2.5 -2.3 -2.1 -2.1 -2.0 -2.5 -2.8 -2.5 -2.2 -2.0 -2.0 -2.0 -1.9 -2.1 -2.0 -1.8 -1.8 -1.9 -2.1 -2.2 -2.5 -2.8 -3.1 -2.7 -2.5 -2.2
-2.9 -2.6 -2.7 -2.9 -2.9 -2.8 -3.1 -2.6 -2.1 -2.1 -2.2 -2.0 -2.0 -1.9 -2.1 -2.8 -3.3 -3.0 -2.8 -2.6 -2.4 -2.2 -1.9 -2.1 -2.6 -2.9 -3.2 -3.2 -2.9 -2.7 -2.5 -2.6 -2.7 -2.7 -2.5 -3.1
-5.9 -4.8 -4.3 -4.0 -4.0 -4.0 -3.1 -2.6 -2.4 -2.7 -3.7 -2.8 -2.6 -2.6 -3.2 -3.9 -3.5 -3.1 -3.4 -3.3 -3.8 -3.1 -2.1 -2.9 -3.8 -4.6 -5.4 -5.5 -4.5 -4.5 -3.0 -3.1 -3.3 -3.9 -3.9 -5.3
-5.4 -4.3 -3.6 -2.5 -2.2 -2.2 -2.1 -2.1 -2.1 -2.1 -3.9 -5.4 -4.4 -3.7 -2.5 -2.7 -2.5 -2.2 -2.4 -4.1 -5.9 -4.0 -2.9 -3.3 -4.5 -4.8 -4.9 -4.9 -5.4 -5.0 -3.7 -3.7 -3.9 -3.6 -3.9 -4.5
-4.1 -4.2 -4.1 -3.7 -2.8 -2.1 -2.0 -1.9 -2.0 -2.1 -3.4 -5.4 -6.0 -4.3 -2.8 -2.4 -2.4 -2.1 -2.0 -3.6 -5.0 -4.5 -4.3 -3.9 -3.8 -3.4 -3.3 -2.9 -2.7 -2.7 -3.7 -3.5 -3.0 -2.3 -2.6 -3.2
-2.1 -2.4 -2.9 -3.2 -3.7 -3.2 -2.4 -2.0 -2.0 -1.8 -1.8 -3.7 -4.5 -3.5 -3.6 -3.3 -2.6 -2.1 -1.9 -2.3 -3.2 -2.9 -2.7 -3.1 -3.1 -2.4 -2.1 -1.9 -1.9 -2.3 -3.0 -2.4 -2.2 -2.3 -2.2 -2.3
-1.9 -2.2 -2.3 -2.2 -2.3 -2.8 -3.1 -2.5 -2.2 -1.8 -1.7 -2.8 -3.1 -2.4 -2.4 -2.8 -2.8 -2.1 -1.8 -1.9 -2.4 -2.1 -1.9 -1.8 -2.0 -2.1 -2.0 -2.0 -1.9 -2.0 -2.3 -2.0 -2.0 -1.9 -2.0 -1.9
-1.5 -1.6 -1.6 -1.6 -1.5 -1.4 -1.6 -1.6 -1.7 -1.6 -1.7 -1.9 -1.6 -1.5 -1.3 -1.4 -1.4 -1.6 -1.6 -1.7 -1.7 -1.7 -1.6 -1.6 -1.4 -1.4 -1.6 -1.7 -1.5 -1.6 -1.6 -1.5 -1.6 -1.5 -1.5 -1.8
-1.1 -1.1 -1.1 -1.0 -0.9 -0.8 -0.7 -0.7 -0.8 -1.0 -1.2 -1.4 -1.1 -0.9 -0.8 -0.7 -0.7 -0.8 -0.7 -0.7 -0.8 -0.8 -0.6 -0.6 -0.6 -0.6 -0.7 -0.9 -0.9 -0.9 -0.9 -0.9 -0.9 -0.9 -1.0 -1.1
-0.5 -0.5 -0.5 -0.5 -0.4 -0.4 -0.3 -0.2 -0.2 -0.3 -0.5 -0.6 -0.6 -0.4 -0.3 -0.1 -0.1 -0.1 -0.1 -0.2 -0.2 -0.3 -0.2 -0.2 -0.1 -0.1 -0.1 -0.2 -0.2 -0.3 -0.2 -0.2 -0.3 -0.3 -0.4 -0.5
-0.1 -0.2 -0.2 -0.2 -0.1 -0.1 -0.1 -0.1 -0.2 -0.1 -0.2 -0.3 -0.2 -0.1 0.0 0.1 0.1 0.1 0.0 0.0 0.0 0.1 0.2 0.2 0.2 0.2 0.3 0.3 0.3 0.3 0.3 0.3 0.2 0.0 -0.1 -0.1
0.1 0.1 0.1 0.0 0.0 0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.2 0.2 0.2 0.3 0.3 0.4 0.4 0.4 0.3 0.2 0.2 0.1 0.1
150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S

Figure 57. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS8 (Surface)
NOAA17, using all observations

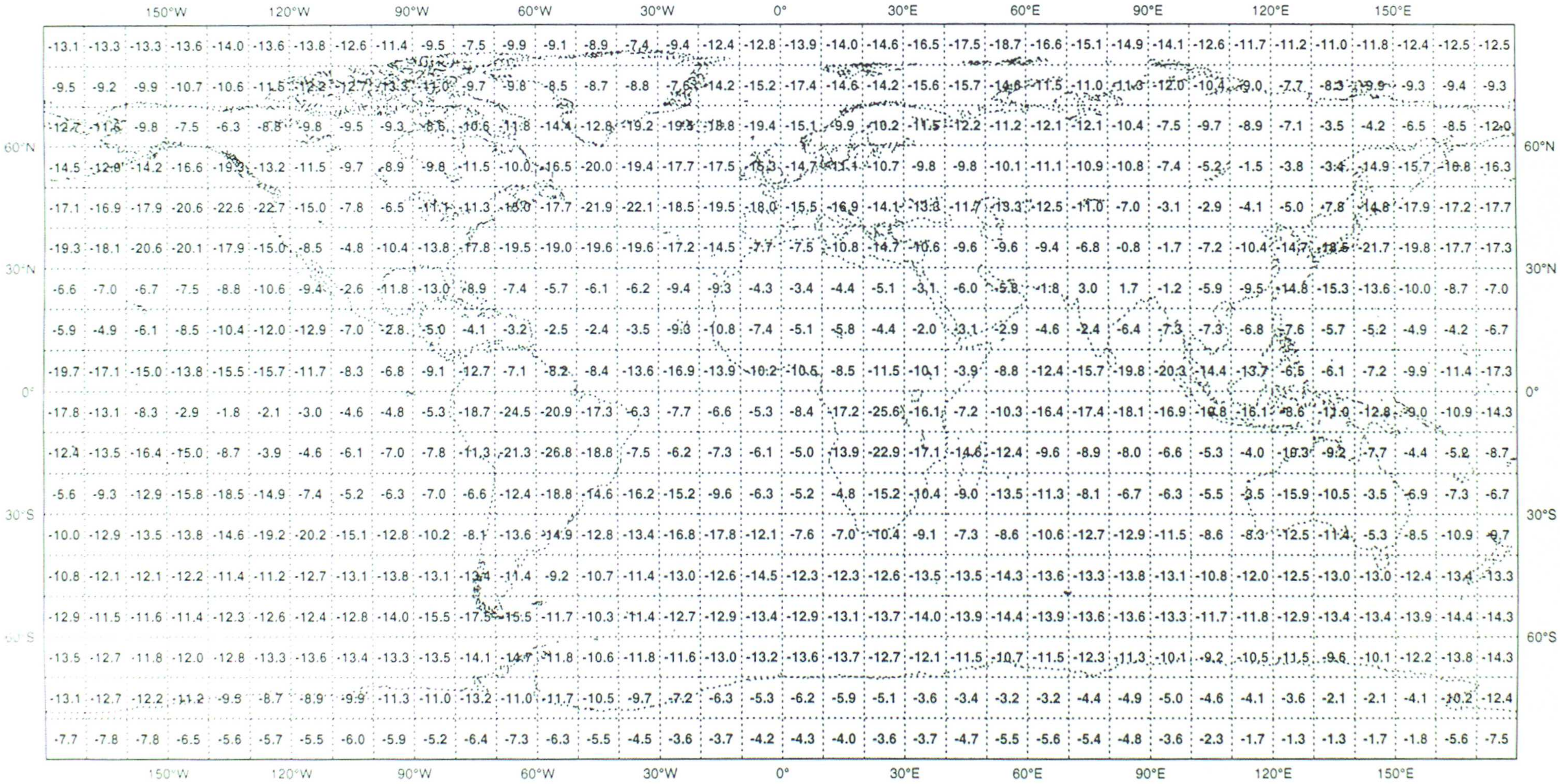
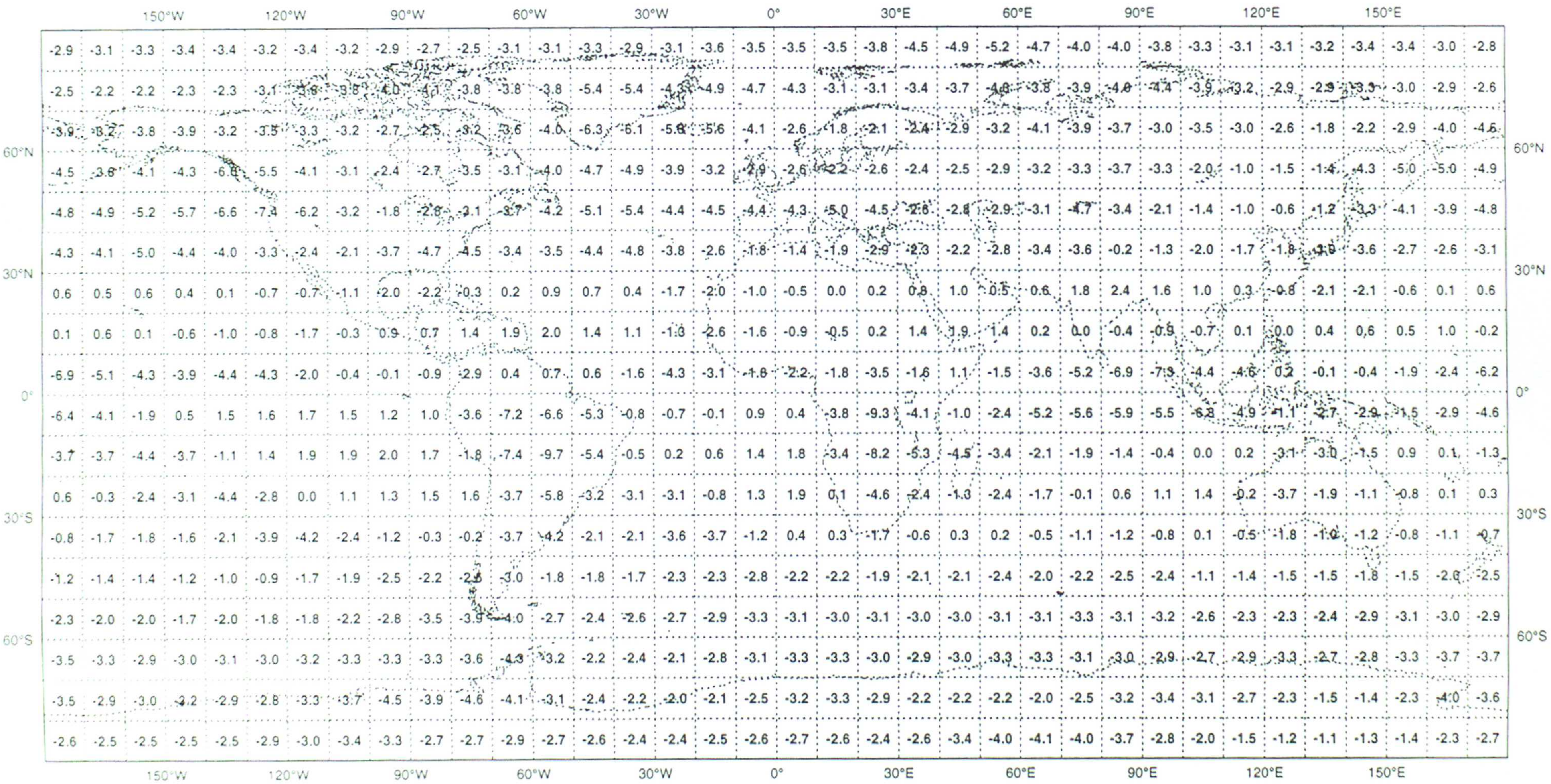

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-13.1 -13.3 -13.3 -13.6 -14.0 -13.6 -13.8 -12.6 -11.4 -9.5 -7.5 -9.9 -9.1 -8.9 -7.4 -9.4 -12.4 -12.8 -13.9 -14.0 -14.6 -16.5 -17.5 -18.7 -16.6 -15.1 -14.9 -14.1 -12.6 -11.7 -11.2 -11.0 -11.8 -12.4 -12.5 -12.5
-9.5 -9.2 -9.9 -10.7 -10.6 -11.5 -12.2 -12.7 -13.3 -13.0 -9.7 -9.8 -8.5 -8.7 -8.8 -7.6 -14.2 -15.2 -17.4 -14.6 -14.2 -15.6 -15.7 -14.6 -11.5 -11.0 -11.3 -12.0 -10.4 -9.0 -7.7 -8.3 -9.9 -9.3 -9.4 -9.3
-12.7 -11.6 -9.8 -7.5 -6.3 -8.8 -9.8 -9.5 -9.3 -8.6 -10.6 -11.8 -14.4 -12.8 -19.2 -19.3 -18.8 -19.4 -15.1 -9.9 -10.2 -11.5 -12.2 -11.2 -12.1 -12.1 -10.4 -7.5 -9.7 -8.9 -7.1 -3.5 -4.2 -6.5 -8.5 -12.0
-14.5 -12.8 -14.2 -16.6 -19.3 -13.2 -11.5 -9.7 -8.9 -9.8 -11.5 -10.0 -16.5 -20.0 -19.4 -17.7 -17.5 -15.3 -14.7 -11.1 -10.7 -9.8 -9.8 -10.1 -11.1 -10.9 -10.8 -7.4 -5.2 -1.5 -3.8 -3.4 -14.9 -15.7 -16.8 -16.3
-17.1 -16.9 -17.9 -20.6 -22.6 -22.7 -15.0 -7.8 -6.5 -11.1 -11.3 -15.0 -17.7 -21.9 -22.1 -18.5 -19.5 -18.0 -15.5 -16.9 -14.1 -13.8 -11.7 -13.3 -12.5 -11.0 -7.0 -3.1 -2.9 -4.1 -5.0 -7.8 -14.8 -17.9 -17.2 -17.7
-19.3 -18.1 -20.6 -20.1 -17.9 -15.0 -8.5 -4.8 -10.4 -13.8 -17.8 -19.5 -19.0 -19.6 -19.6 -17.2 -14.5 -7.7 -7.5 -10.8 -14.7 -10.6 -9.6 -9.6 -9.4 -6.8 -0.8 -1.7 -7.2 -10.4 -14.7 -18.5 -21.7 -19.8 -17.7 -17.3
-6.6 -7.0 -6.7 -7.5 -8.8 -10.6 -9.4 -2.6 -11.8 -13.0 -8.9 -7.4 -5.7 -6.1 -6.2 -9.4 -9.3 -4.3 -3.4 -4.4 -5.1 -3.1 -6.0 -5.8 -1.8 3.0 1.7 -1.2 -5.9 -9.5 -14.8 -15.3 -13.6 -10.0 -8.7 -7.0
-5.9 -4.9 -6.1 -8.5 -10.4 -12.0 -12.9 -7.0 -2.8 -5.0 -4.1 -3.2 -2.5 -2.4 -3.5 -9.3 -10.8 -7.4 -5.1 -5.8 -4.4 -2.0 -3.1 -2.9 -4.6 -2.4 -6.4 -7.3 -7.3 -6.8 -7.6 -5.7 -5.2 -4.9 -4.2 -6.7
-19.7 -17.1 -15.0 -13.8 -15.5 -15.7 -11.7 -8.3 -6.8 -9.1 -12.7 -7.1 -8.2 -8.4 -13.6 -16.9 -13.9 -10.2 -10.6 -8.5 -11.5 -10.1 -3.9 -8.8 -12.4 -15.7 -19.8 -20.3 -14.4 -13.7 -6.5 -6.1 -7.2 -9.9 -11.4 -17.3
-17.8 -13.1 -8.3 -2.9 -1.8 -2.1 -3.0 -4.6 -4.8 -5.3 -18.7 -24.5 -20.9 -17.3 -6.3 -7.7 -6.6 -5.3 -8.4 -17.2 -25.6 -16.1 -7.2 -10.3 -16.4 -17.4 -18.1 -16.9 -10.8 -16.1 -8.6 -11.0 -12.8 -9.0 -10.9 -14.3
-12.4 -13.5 -16.4 -15.0 -8.7 -3.9 -4.6 -6.1 -7.0 -7.8 -11.3 -21.3 -26.8 -18.8 -7.5 -6.2 -7.3 -6.1 -5.0 -13.9 -22.9 -17.1 -14.6 -12.4 -9.6 -8.9 -8.0 -6.6 -5.3 -4.0 -10.3 -9.2 -7.7 -4.4 -5.2 -8.7
-5.6 -9.3 -12.9 -15.8 -18.5 -14.9 -7.4 -5.2 -6.3 -7.0 -6.6 -12.4 -18.8 -14.6 -16.2 -15.2 -9.6 -6.3 -5.2 -4.8 -15.2 -10.4 -9.0 -13.5 -11.3 -8.1 -6.7 -6.3 -5.5 -3.5 -15.9 -10.5 -3.5 -6.9 -7.3 -6.7
-10.0 -12.9 -13.5 -13.8 -14.6 -19.2 -20.2 -15.1 -12.8 -10.2 -8.1 -13.6 -14.9 -12.8 -13.4 -16.8 -17.8 -12.1 -7.6 -7.0 -10.4 -9.1 -7.3 -8.6 -10.6 -12.7 -12.9 -11.5 -8.6 -8.3 -12.5 -11.4 -5.3 -8.5 -10.9 -9.7
-10.8 -12.1 -12.1 -12.2 -11.4 -11.2 -12.7 -13.1 -13.8 -13.1 -13.4 -11.4 -9.2 -10.7 -11.4 -13.0 -12.6 -14.5 -12.3 -12.3 -12.6 -13.5 -13.5 -14.3 -13.6 -13.3 -13.8 -13.1 -10.8 -12.0 -12.5 -13.0 -13.0 -12.4 -13.4 -13.3
-12.9 -11.5 -11.6 -11.4 -12.3 -12.6 -12.4 -12.8 -14.0 -15.5 -17.5 -15.5 -11.7 -10.3 -11.4 -12.7 -12.9 -13.4 -12.9 -13.1 -13.7 -14.0 -13.9 -14.4 -13.9 -13.6 -13.6 -13.3 -11.7 -11.8 -12.9 -13.4 -13.4 -13.9 -14.4 -14.3
-13.5 -12.7 -11.8 -12.0 -12.8 -13.3 -13.6 -13.4 -13.3 -13.5 -14.1 -14.7 -11.8 -10.6 -11.8 -11.6 -13.0 -13.2 -13.6 -13.7 -12.7 -12.1 -11.5 -10.7 -11.5 -12.3 -11.3 -10.1 -9.2 -10.5 -11.5 -9.6 -10.1 -12.2 -13.8 -14.3
-13.1 -12.7 -12.2 -11.2 -9.5 -8.7 -8.9 -9.9 -11.3 -11.0 -13.2 -11.0 -11.7 -10.5 -9.7 -7.2 -6.3 -5.3 -6.2 -5.9 -5.1 -3.6 -3.4 -3.2 -3.2 -4.4 -4.9 -5.0 -4.6 -4.1 -3.6 -2.1 -2.1 -4.1 -10.2 -12.4
-7.7 -7.8 -7.8 -6.5 -5.6 -5.7 -5.5 -6.0 -5.9 -5.2 -6.4 -7.3 -6.3 -5.5 -4.5 -3.6 -3.7 -4.2 -4.3 -4.0 -3.6 -3.7 -4.7 -5.5 -5.6 -5.4 -4.8 -3.6 -2.3 -1.7 -1.3 -1.3 -1.7 -1.8 -5.6 -7.5

Figure 58. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS15 (700 hPa)
NOAA17, using all observations



-2.9	-3.1	-3.3	-3.4	-3.4	-3.2	-3.4	-3.2	-2.9	-2.7	-2.5	-3.1	-3.1	-3.3	-2.9	-3.1	-3.6	-3.5	-3.5	-3.5	-3.8	-4.5	-4.9	-5.2	-4.7	-4.0	-4.0	-3.8	-3.3	-3.1	-3.1	-3.2	-3.4	-3.4	-3.0	-2.8
-2.5	-2.2	-2.2	-2.3	-2.3	-3.1	-3.8	-3.8	-4.0	-4.1	-3.8	-3.8	-3.8	-5.4	-5.4	-4.3	-4.9	-4.7	-4.3	-3.1	-3.1	-3.4	-3.7	-4.8	-3.8	-3.9	-4.0	-4.4	-3.9	-3.2	-2.9	-2.9	-3.3	-3.0	-2.9	-2.6
-3.9	-3.2	-3.8	-3.9	-3.2	-3.5	-3.3	-3.2	-2.7	-2.5	-3.2	-3.6	-4.0	-6.3	-6.1	-5.8	-5.6	-4.1	-2.6	-1.8	-2.1	-2.4	-2.9	-3.2	-4.1	-3.9	-3.7	-3.0	-3.5	-3.0	-2.6	-1.8	-2.2	-2.9	-4.0	-4.6
-4.5	-3.6	-4.1	-4.3	-6.8	-5.5	-4.1	-3.1	-2.4	-2.7	-3.5	-3.1	-4.0	-4.7	-4.9	-3.9	-3.2	-2.9	-2.6	-2.2	-2.6	-2.4	-2.5	-2.9	-3.2	-3.3	-3.7	-3.3	-2.0	-1.0	-1.5	-1.4	-4.3	-5.0	-5.0	-4.9
-4.8	-4.9	-5.2	-5.7	-6.6	-7.4	-6.2	-3.2	-1.8	-2.8	-3.1	-3.7	-4.2	-5.1	-5.4	-4.4	-4.5	-4.4	-4.3	-5.0	-4.5	-2.6	-2.8	-2.9	-3.1	-4.7	-3.4	-2.1	-1.4	-1.0	-0.6	-1.2	-3.3	-4.1	-3.9	-4.8
-4.3	-4.1	-5.0	-4.4	-4.0	-3.3	-2.4	-2.1	-3.7	-4.7	-4.5	-3.4	-3.5	-4.4	-4.8	-3.8	-2.6	-1.8	-1.4	-1.9	-2.9	-2.3	-2.2	-2.8	-3.4	-3.6	-0.2	-1.3	-2.0	-1.7	-1.8	-3.0	-3.6	-2.7	-2.6	-3.1
0.6	0.5	0.6	0.4	0.1	-0.7	-0.7	-1.1	-2.0	-2.2	-0.3	0.2	0.9	0.7	0.4	-1.7	-2.0	-1.0	-0.5	0.0	0.2	0.8	1.0	0.5	0.6	1.8	2.4	1.6	1.0	0.3	-0.8	-2.1	-2.1	-0.6	0.1	0.6
0.1	0.6	0.1	-0.6	-1.0	-0.8	-1.7	-0.3	0.9	0.7	1.4	1.9	2.0	1.4	1.1	-1.3	-2.6	-1.6	-0.9	-0.5	0.2	1.4	1.9	1.4	0.2	0.0	-0.4	-0.9	-0.7	0.1	0.0	0.4	0.6	0.5	1.0	-0.2
-6.9	-5.1	-4.3	-3.9	-4.4	-4.3	-2.0	-0.4	-0.1	-0.9	-2.9	0.4	0.7	0.6	-1.6	-4.3	-3.1	-1.8	-2.2	-1.8	-3.5	-1.6	1.1	-1.5	-3.6	-5.2	-6.9	-7.3	-4.4	-4.6	0.2	-0.1	-0.4	-1.9	-2.4	-6.2
-6.4	-4.1	-1.9	0.5	1.5	1.6	1.7	1.5	1.2	1.0	-3.6	-7.2	-6.6	-5.3	-0.8	-0.7	-0.1	0.9	0.4	-3.8	-9.3	-4.1	-1.0	-2.4	-5.2	-5.6	-5.9	-5.5	-6.8	-4.9	-1.1	-2.7	-2.9	-1.5	-2.9	-4.6
-3.7	-3.7	-4.4	-3.7	-1.1	1.4	1.9	1.9	2.0	1.7	-1.8	-7.4	-9.7	-5.4	-0.5	0.2	0.6	1.4	1.8	-3.4	-8.2	-5.3	-4.5	-3.4	-2.1	-1.9	-1.4	-0.4	0.0	0.2	-3.1	-3.0	-1.5	0.9	0.1	-1.3
0.6	-0.3	-2.4	-3.1	-4.4	-2.8	0.0	1.1	1.3	1.5	1.6	-3.7	-5.8	-3.2	-3.1	-3.1	-0.8	1.3	1.9	0.1	-4.6	-2.4	-1.3	-2.4	-1.7	-0.1	0.6	1.1	1.4	-0.2	-3.7	-1.9	-1.1	-0.8	0.1	0.3
-0.8	-1.7	-1.8	-1.6	-2.1	-3.9	-4.2	-2.4	-1.2	-0.3	-0.2	-3.7	-4.2	-2.1	-2.1	-3.6	-3.7	-1.2	0.4	0.3	-1.7	-0.6	0.3	0.2	-0.5	-1.1	-1.2	-0.8	0.1	-0.5	-1.8	-1.0	-1.2	-0.8	-1.1	-0.7
-1.2	-1.4	-1.4	-1.2	-1.0	-0.9	-1.7	-1.9	-2.5	-2.2	-2.5	-3.0	-1.8	-1.8	-1.7	-2.3	-2.3	-2.8	-2.2	-2.2	-1.9	-2.1	-2.1	-2.4	-2.0	-2.2	-2.5	-2.4	-1.1	-1.4	-1.5	-1.5	-1.8	-1.5	-2.0	-2.5
-2.3	-2.0	-2.0	-1.7	-2.0	-1.8	-1.8	-2.2	-2.8	-3.5	-3.9	-4.0	-2.7	-2.4	-2.6	-2.7	-2.9	-3.3	-3.1	-3.0	-3.1	-3.0	-3.0	-3.1	-3.1	-3.3	-3.1	-3.2	-2.6	-2.3	-2.3	-2.4	-2.9	-3.1	-3.0	-2.9
-3.5	-3.3	-2.9	-3.0	-3.1	-3.0	-3.2	-3.3	-3.3	-3.3	-3.6	-4.3	-3.2	-2.2	-2.4	-2.1	-2.8	-3.1	-3.3	-3.3	-3.0	-2.9	-3.0	-3.3	-3.3	-3.1	-3.0	-2.9	-2.7	-2.9	-3.3	-2.7	-2.8	-3.3	-3.7	-3.7
-3.5	-2.9	-3.0	-3.2	-2.9	-2.8	-3.3	-3.7	-4.5	-3.9	-4.6	-4.1	-3.1	-2.4	-2.2	-2.0	-2.1	-2.5	-3.2	-3.3	-2.9	-2.2	-2.2	-2.2	-2.0	-2.5	-3.2	-3.4	-3.1	-2.7	-2.3	-1.5	-1.4	-2.3	-4.0	-3.6
-2.6	-2.5	-2.5	-2.5	-2.5	-2.9	-3.0	-3.4	-3.3	-2.7	-2.7	-2.9	-2.7	-2.6	-2.4	-2.4	-2.5	-2.6	-2.7	-2.6	-2.4	-2.6	-3.4	-4.0	-4.1	-4.0	-3.7	-2.8	-2.0	-1.5	-1.2	-1.1	-1.3	-1.4	-2.3	-2.7

Figure 59. ATOVS SD O-B brightness temperature differences (deg C). **DECEMBER 2002**
Channel: HIRS15 (700 hPa)
NOAA17, using all observations

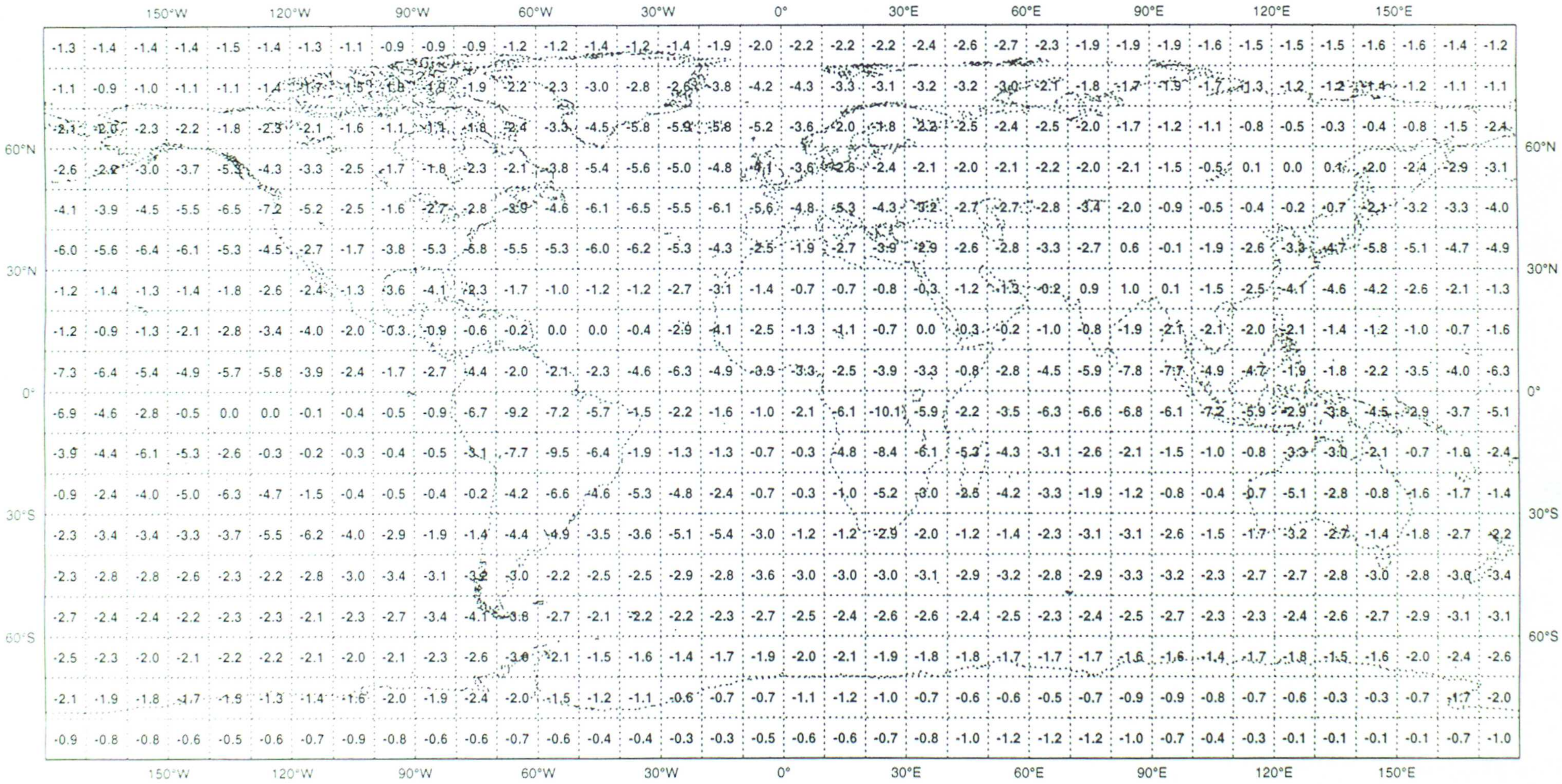

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
-1.3 -1.4 -1.4 -1.4 -1.5 -1.4 -1.3 -1.1 -0.9 -0.9 -0.9 -1.2 -1.2 -1.4 -1.2 -1.4 -1.9 -2.0 -2.2 -2.2 -2.2 -2.4 -2.6 -2.7 -2.3 -1.9 -1.9 -1.9 -1.6 -1.5 -1.5 -1.5 -1.6 -1.6 -1.4 -1.2
-1.1 -0.9 -1.0 -1.1 -1.1 -1.4 -1.7 -1.5 -1.8 -1.9 -1.9 -2.2 -2.3 -3.0 -2.8 -2.6 -3.8 -4.2 -4.3 -3.3 -3.1 -3.2 -3.2 -3.0 -2.1 -1.8 -1.7 -1.9 -1.7 -1.3 -1.2 -1.2 -1.4 -1.2 -1.1 -1.1
-2.1 -2.0 -2.3 -2.2 -1.8 -2.3 -2.1 -1.6 -1.1 -1.1 -1.8 -2.4 -3.3 -4.5 -5.8 -5.9 -5.8 -5.2 -3.6 -2.0 -1.8 -2.2 -2.5 -2.4 -2.5 -2.0 -1.7 -1.2 -1.1 -0.8 -0.5 -0.3 -0.4 -0.8 -1.5 -2.4
-2.6 -2.2 -3.0 -3.7 -5.3 -4.3 -3.3 -2.5 -1.7 -1.8 -2.3 -2.1 -3.8 -5.4 -5.6 -5.0 -4.8 -4.1 -3.6 -2.6 -2.4 -2.1 -2.0 -2.1 -2.2 -2.0 -2.1 -1.5 -0.5 0.1 0.0 0.1 -2.0 -2.4 -2.9 -3.1
-4.1 -3.9 -4.5 -5.5 -6.5 -7.2 -5.2 -2.5 -1.6 -2.7 -2.8 -3.9 -4.6 -6.1 -6.5 -5.5 -6.1 -5.6 -4.8 -5.3 -4.3 -3.2 -2.7 -2.7 -2.8 -3.4 -2.0 -0.9 -0.5 -0.4 -0.2 -0.7 -2.1 -3.2 -3.3 -4.0
-6.0 -5.6 -6.4 -6.1 -5.3 -4.5 -2.7 -1.7 -3.8 -5.3 -5.8 -5.5 -5.3 -6.0 -6.2 -5.3 -4.3 -2.5 -1.9 -2.7 -3.9 -2.9 -2.6 -2.8 -3.3 -2.7 0.6 -0.1 -1.9 -2.6 -3.3 -4.7 -5.8 -5.1 -4.7 -4.9
-1.2 -1.4 -1.3 -1.4 -1.8 -2.6 -2.4 -1.3 -3.6 -4.1 -2.3 -1.7 -1.0 -1.2 -1.2 -2.7 -3.1 -1.4 -0.7 -0.7 -0.8 -0.3 -1.2 -1.3 -0.2 0.9 1.0 0.1 -1.5 -2.5 -4.1 -4.6 -4.2 -2.6 -2.1 -1.3
-1.2 -0.9 -1.3 -2.1 -2.8 -3.4 -4.0 -2.0 -0.3 -0.9 -0.6 -0.2 0.0 0.0 -0.4 -2.9 -4.1 -2.5 -1.3 -1.1 -0.7 0.0 -0.3 -0.2 -1.0 -0.8 -1.9 -2.1 -2.1 -2.0 -2.1 -1.4 -1.2 -1.0 -0.7 -1.6
-7.3 -6.4 -5.4 -4.9 -5.7 -5.8 -3.9 -2.4 -1.7 -2.7 -4.4 -2.0 -2.1 -2.3 -4.6 -6.3 -4.9 -3.9 -3.3 -2.5 -3.9 -3.3 -0.8 -2.8 -4.5 -5.9 -7.8 -7.7 -4.9 -4.7 -1.9 -1.8 -2.2 -3.5 -4.0 -6.3
-6.9 -4.6 -2.8 -0.5 0.0 0.0 -0.1 -0.4 -0.5 -0.9 -6.7 -9.2 -7.2 -5.7 -1.5 -2.2 -1.6 -1.0 -2.1 -6.1 -10.1 -5.9 -2.2 -3.5 -6.3 -6.6 -6.8 -6.1 -7.2 -5.9 -2.9 -3.8 -4.5 -2.9 -3.7 -5.1
-3.9 -4.4 -6.1 -5.3 -2.6 -0.3 -0.2 -0.3 -0.4 -0.5 -3.1 -7.7 -9.5 -6.4 -1.9 -1.3 -1.3 -0.7 -0.3 -4.8 -8.4 -6.1 -5.3 -4.3 -3.1 -2.6 -2.1 -1.5 -1.0 -0.8 -3.3 -3.0 -2.1 -0.7 -1.9 -2.4
-0.9 -2.4 -4.0 -5.0 -6.3 -4.7 -1.5 -0.4 -0.5 -0.4 -0.2 -4.2 -6.6 -4.6 -5.3 -4.8 -2.4 -0.7 -0.3 -1.0 -5.2 -3.0 -2.5 -4.2 -3.3 -1.9 -1.2 -0.8 -0.4 -0.7 -5.1 -2.8 -0.8 -1.6 -1.7 -1.4
-2.3 -3.4 -3.4 -3.3 -3.7 -5.5 -6.2 -4.0 -2.9 -1.9 -1.4 -4.4 -4.9 -3.5 -3.6 -5.1 -5.4 -3.0 -1.2 -1.2 -2.9 -2.0 -1.2 -1.4 -2.3 -3.1 -3.1 -2.6 -1.5 -1.7 -3.2 -2.7 -1.4 -1.8 -2.7 -2.2
-2.3 -2.8 -2.8 -2.6 -2.3 -2.2 -2.8 -3.0 -3.4 -3.1 -3.2 -3.0 -2.2 -2.5 -2.5 -2.9 -2.8 -3.6 -3.0 -3.0 -3.0 -3.1 -2.9 -3.2 -2.8 -2.9 -3.3 -3.2 -2.3 -2.7 -2.7 -2.8 -3.0 -2.8 -3.0 -3.4
-2.7 -2.4 -2.4 -2.2 -2.3 -2.3 -2.1 -2.3 -2.7 -3.4 -4.1 -3.8 -2.7 -2.1 -2.2 -2.2 -2.3 -2.7 -2.5 -2.4 -2.6 -2.6 -2.4 -2.5 -2.3 -2.4 -2.5 -2.7 -2.3 -2.3 -2.4 -2.6 -2.7 -2.9 -3.1 -3.1
-2.5 -2.3 -2.0 -2.1 -2.2 -2.2 -2.1 -2.0 -2.1 -2.3 -2.6 -3.0 -2.1 -1.5 -1.6 -1.4 -1.7 -1.9 -2.0 -2.1 -1.9 -1.8 -1.8 -1.7 -1.7 -1.7 -1.6 -1.6 -1.4 -1.7 -1.8 -1.5 -1.6 -2.0 -2.4 -2.6
-2.1 -1.9 -1.8 -1.7 -1.9 -1.3 -1.4 -1.6 -2.0 -1.9 -2.4 -2.0 -1.5 -1.2 -1.1 -0.6 -0.7 -0.7 -1.1 -1.2 -1.0 -0.7 -0.6 -0.6 -0.5 -0.7 -0.9 -0.9 -0.8 -0.7 -0.6 -0.3 -0.3 -0.7 -1.7 -2.0
-0.9 -0.8 -0.8 -0.6 -0.5 -0.6 -0.7 -0.9 -0.8 -0.6 -0.6 -0.7 -0.6 -0.4 -0.4 -0.3 -0.3 -0.5 -0.6 -0.6 -0.7 -0.8 -1.0 -1.2 -1.2 -1.2 -1.0 -0.7 -0.4 -0.3 -0.1 -0.1 -0.1 -0.1 -0.7 -1.0

Figure 60. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA17, using all observations

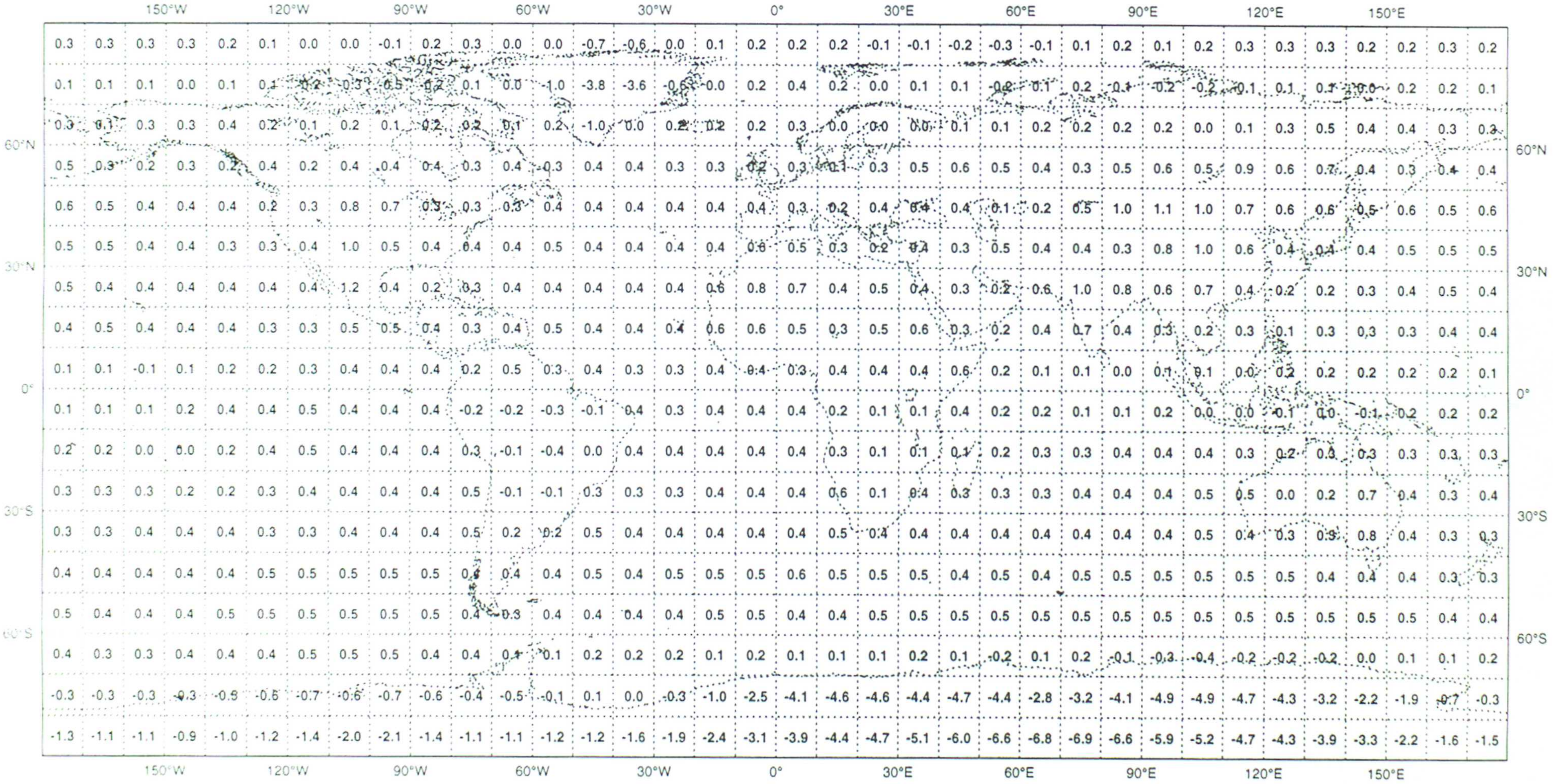
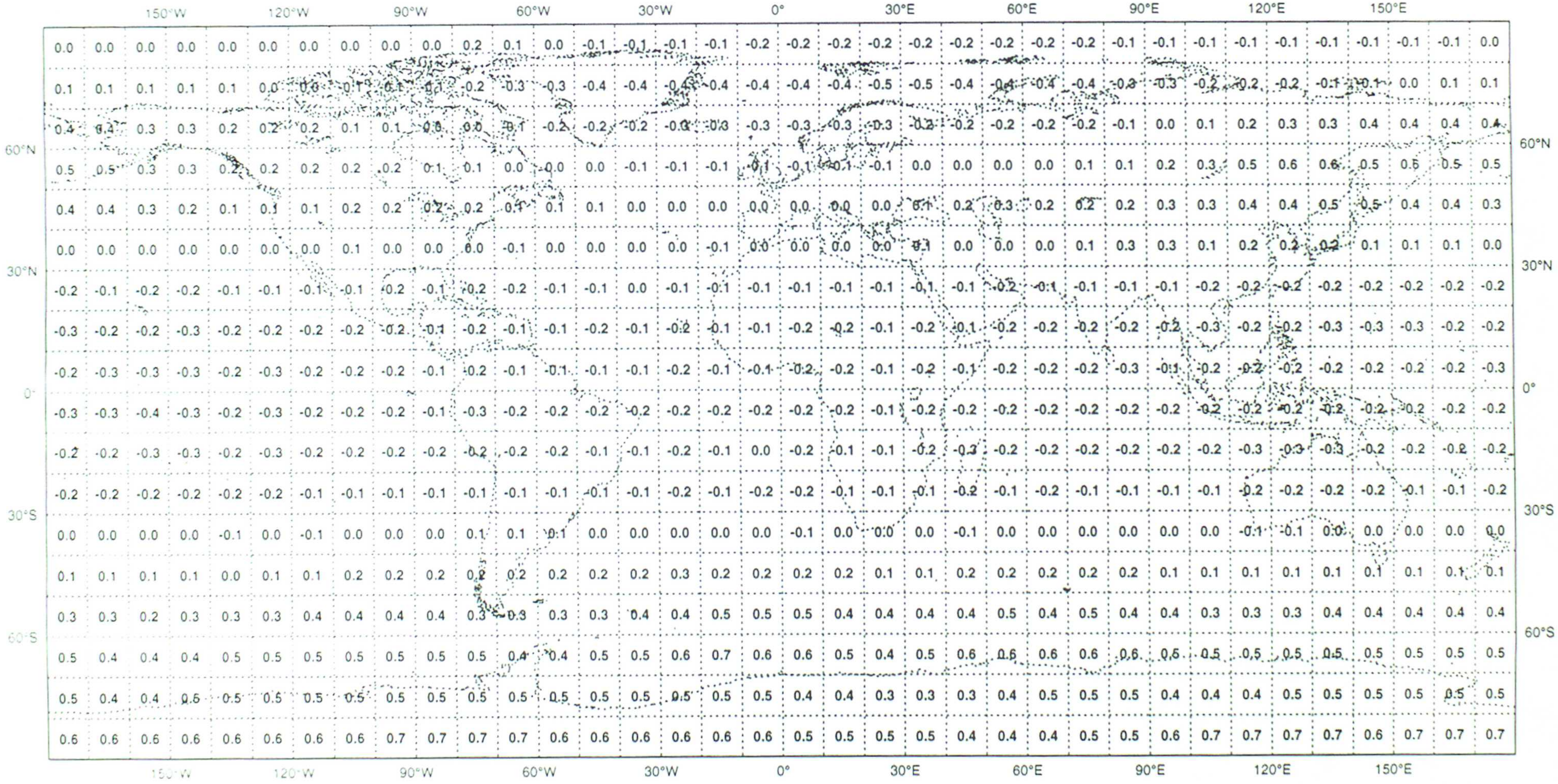
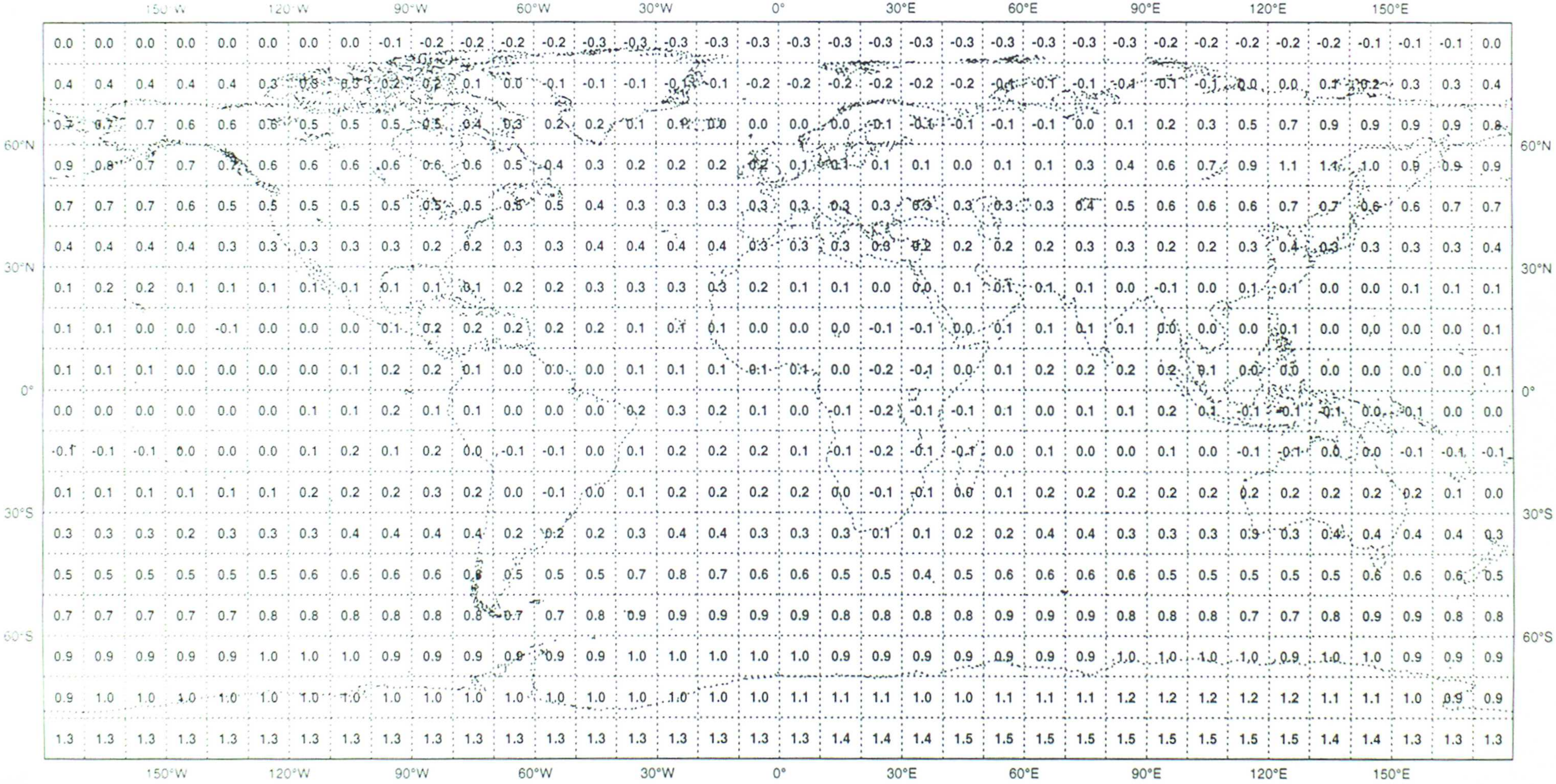

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N
30°N
0°
30°S
60°S
0.3 0.3 0.3 0.3 0.2 0.1 0.0 0.0 -0.1 0.2 0.3 0.0 0.0 -0.7 -0.6 0.0 0.1 0.2 0.2 0.2 -0.1 -0.1 -0.2 -0.3 -0.1 0.1 0.2 0.1 0.2 0.3 0.3 0.3 0.2 0.2 0.3 0.2
0.1 0.1 0.1 0.0 0.1 0.1 -0.2 -0.3 -0.5 -0.2 0.1 0.0 -1.0 -3.8 -3.6 -0.6 -0.0 0.2 0.4 0.2 0.0 0.1 0.1 -0.2 -0.1 0.2 -0.1 -0.2 -0.2 -0.1 0.1 0.1 0.0 0.2 0.2 0.1
0.3 0.1 0.3 0.3 0.4 0.2 0.1 0.2 0.1 0.2 0.2 0.1 0.2 -1.0 0.0 0.2 0.2 0.2 0.3 0.0 0.0 0.0 0.1 0.1 0.2 0.2 0.2 0.2 0.0 0.1 0.3 0.5 0.4 0.4 0.3 0.3
0.5 0.3 0.2 0.3 0.2 0.4 0.2 0.4 0.4 0.4 0.3 0.4 0.3 0.4 0.4 0.3 0.3 0.2 0.3 0.1 0.3 0.5 0.6 0.5 0.4 0.3 0.5 0.6 0.5 0.9 0.6 0.7 0.4 0.3 0.4 0.4
0.6 0.5 0.4 0.4 0.4 0.2 0.3 0.8 0.7 0.3 0.3 0.3 0.4 0.4 0.4 0.4 0.4 0.4 0.3 0.2 0.4 0.4 0.4 0.1 0.2 0.5 1.0 1.1 1.0 0.7 0.6 0.6 0.5 0.6 0.5 0.6
0.5 0.5 0.4 0.4 0.3 0.3 0.4 1.0 0.5 0.4 0.4 0.4 0.5 0.4 0.4 0.4 0.4 0.6 0.5 0.3 0.2 0.4 0.3 0.5 0.4 0.4 0.3 0.8 1.0 0.6 0.4 0.4 0.4 0.5 0.5 0.5
0.5 0.4 0.4 0.4 0.4 0.4 0.4 1.2 0.4 0.2 0.3 0.4 0.4 0.4 0.4 0.4 0.6 0.8 0.7 0.4 0.5 0.4 0.3 0.2 0.6 1.0 0.8 0.6 0.7 0.4 0.2 0.2 0.3 0.4 0.5 0.4
0.4 0.5 0.4 0.4 0.4 0.3 0.3 0.5 0.5 0.4 0.3 0.4 0.5 0.4 0.4 0.4 0.6 0.6 0.5 0.3 0.5 0.6 0.3 0.2 0.4 0.7 0.4 0.3 0.2 0.3 0.1 0.3 0.3 0.3 0.4 0.4
0.1 0.1 -0.1 0.1 0.2 0.2 0.3 0.4 0.4 0.4 0.2 0.5 0.3 0.4 0.3 0.3 0.4 0.4 0.3 0.4 0.4 0.4 0.6 0.2 0.1 0.1 0.0 0.1 0.1 0.0 0.2 0.2 0.2 0.2 0.2 0.1
0.1 0.1 0.1 0.2 0.4 0.4 0.5 0.4 0.4 0.4 -0.2 -0.2 -0.3 -0.1 0.4 0.3 0.4 0.4 0.4 0.2 0.1 0.1 0.4 0.2 0.2 0.1 0.1 0.2 0.0 0.0 -0.1 0.0 -0.1 0.2 0.2 0.2
0.2 0.2 0.0 0.0 0.2 0.4 0.5 0.4 0.4 0.4 0.3 -0.1 -0.4 0.0 0.4 0.4 0.4 0.4 0.4 0.3 0.1 0.1 0.1 0.2 0.3 0.3 0.4 0.4 0.4 0.3 0.2 0.3 0.3 0.3 0.3 0.3
0.3 0.3 0.3 0.2 0.2 0.3 0.4 0.4 0.4 0.4 0.5 -0.1 -0.1 0.3 0.3 0.3 0.4 0.4 0.4 0.6 0.1 0.4 0.3 0.3 0.3 0.4 0.4 0.4 0.5 0.5 0.0 0.2 0.7 0.4 0.3 0.4
0.3 0.3 0.4 0.4 0.4 0.3 0.3 0.4 0.4 0.4 0.5 0.2 0.2 0.5 0.4 0.4 0.4 0.4 0.4 0.5 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.4 0.5 0.4 0.3 0.3 0.8 0.4 0.3 0.3
0.4 0.4 0.4 0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.4 0.4 0.4 0.5 0.4 0.5 0.5 0.5 0.6 0.5 0.5 0.5 0.4 0.5 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.4 0.4 0.3 0.3
0.5 0.4 0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.3 0.4 0.4 0.4 0.4 0.5 0.5 0.4 0.4 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.5 0.4 0.4
0.4 0.3 0.3 0.4 0.4 0.4 0.5 0.5 0.5 0.4 0.4 0.4 0.1 0.2 0.2 0.2 0.1 0.2 0.1 0.1 0.1 0.2 0.1 -0.2 0.1 0.2 -0.1 -0.3 -0.4 -0.2 -0.2 -0.2 0.0 0.1 0.1 0.2
-0.3 -0.3 -0.3 -0.3 -0.5 -0.6 -0.7 -0.6 -0.7 -0.6 -0.4 -0.5 -0.1 0.1 0.0 -0.3 -1.0 -2.5 -4.1 -4.6 -4.6 -4.4 -4.7 -4.4 -2.8 -3.2 -4.1 -4.9 -4.9 -4.7 -4.3 -3.2 -2.2 -1.9 -0.7 -0.3
-1.3 -1.1 -1.1 -0.9 -1.0 -1.2 -1.4 -2.0 -2.1 -1.4 -1.1 -1.1 -1.2 -1.2 -1.6 -1.9 -2.4 -3.1 -3.9 -4.4 -4.7 -5.1 -6.0 -6.6 -6.8 -6.9 -6.6 -5.9 -5.2 -4.7 -4.3 -3.9 -3.3 -2.2 -1.6 -1.5

Figure 61. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS11 (500 - 700 hPa)
NOAA17, using all observations



0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0
0.1	0.1	0.1	0.1	0.1	0.0	0.0	-0.1	0.1	-0.1	-0.2	-0.3	-0.3	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.4	-0.5	-0.5	-0.4	-0.4	-0.4	-0.4	-0.3	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	0.0	0.1	0.1
0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.4
0.5	0.5	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.5	0.6	0.6	0.5	0.5	0.5	0.5
0.4	0.4	0.3	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.4	0.4	0.3
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.3	0.3	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.0
-0.2	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.2	-0.2	-0.1	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
-0.3	-0.2	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.1	-0.1	-0.2	-0.1	-0.2	-0.1	-0.1	-0.2	-0.2	-0.1	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.2	-0.2	-0.3	-0.3	-0.3	-0.2	-0.2
-0.2	-0.3	-0.3	-0.3	-0.2	-0.3	-0.2	-0.2	-0.2	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2	-0.2	-0.1	-0.2	-0.1	-0.2	-0.2	-0.2	-0.3	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3
-0.3	-0.3	-0.4	-0.3	-0.2	-0.3	-0.2	-0.2	-0.2	-0.1	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2
-0.2	-0.2	-0.3	-0.3	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2	-0.1	0.0	-0.2	-0.1	-0.1	-0.2	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2
-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	-0.2	-0.1	-0.2	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2
0.0	0.0	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0
0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.6	0.7	0.6	0.6	0.5	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
0.5	0.4	0.4	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.6	0.7	0.7

Figure 62. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS4 (400 hPa)
NOAA17, using all observations



0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.3	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	0.0
0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.1	-0.1	-0.4	-0.1	-0.1	0.0	0.0	0.1	0.2	0.3	0.3	0.4
0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.1	0.2	0.3	0.5	0.7	0.9	0.9	0.9	0.9	0.8
0.9	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.1	0.3	0.4	0.6	0.7	0.9	1.1	1.1	1.0	0.9	0.9	0.9
0.7	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.7	0.7
0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.4
0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	-0.1	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1
0.1	0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	-0.1	-0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	-0.2	-0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1
0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.0	0.0	0.0	0.2	0.3	0.2	0.1	0.0	-0.1	-0.2	-0.1	-0.1	0.1	0.0	0.1	0.1	0.2	0.1	-0.1	-0.1	-0.1	0.0	-0.1	0.0	0.0
-0.1	-0.1	-0.1	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.0	-0.1	-0.1	0.0	0.1	0.2	0.2	0.2	0.1	-0.1	-0.2	-0.1	-0.1	0.0	0.1	0.0	0.0	0.1	0.0	-0.1	-0.1	0.0	0.0	-0.1	-0.1	-0.1
0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.2	0.0	-0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.0	-0.1	-0.1	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.0
0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.2	0.2	0.2	0.3	0.4	0.4	0.3	0.3	0.3	0.1	0.1	0.2	0.2	0.4	0.4	0.3	0.3	0.3	0.9	0.3	0.4	0.4	0.4	0.4	0.3
0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.7	0.8	0.7	0.6	0.6	0.5	0.5	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5
0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.8	0.8	0.8	0.7	0.7	0.8	0.9	0.9	0.8	0.8
0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	0.9	1.0	1.0	0.9	0.9	0.9
0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.0	0.9	0.9
1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.4	1.4	1.3	1.3	1.3

Figure 63. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: HIRS4 (400 hPa)
NOAA17, using all observations

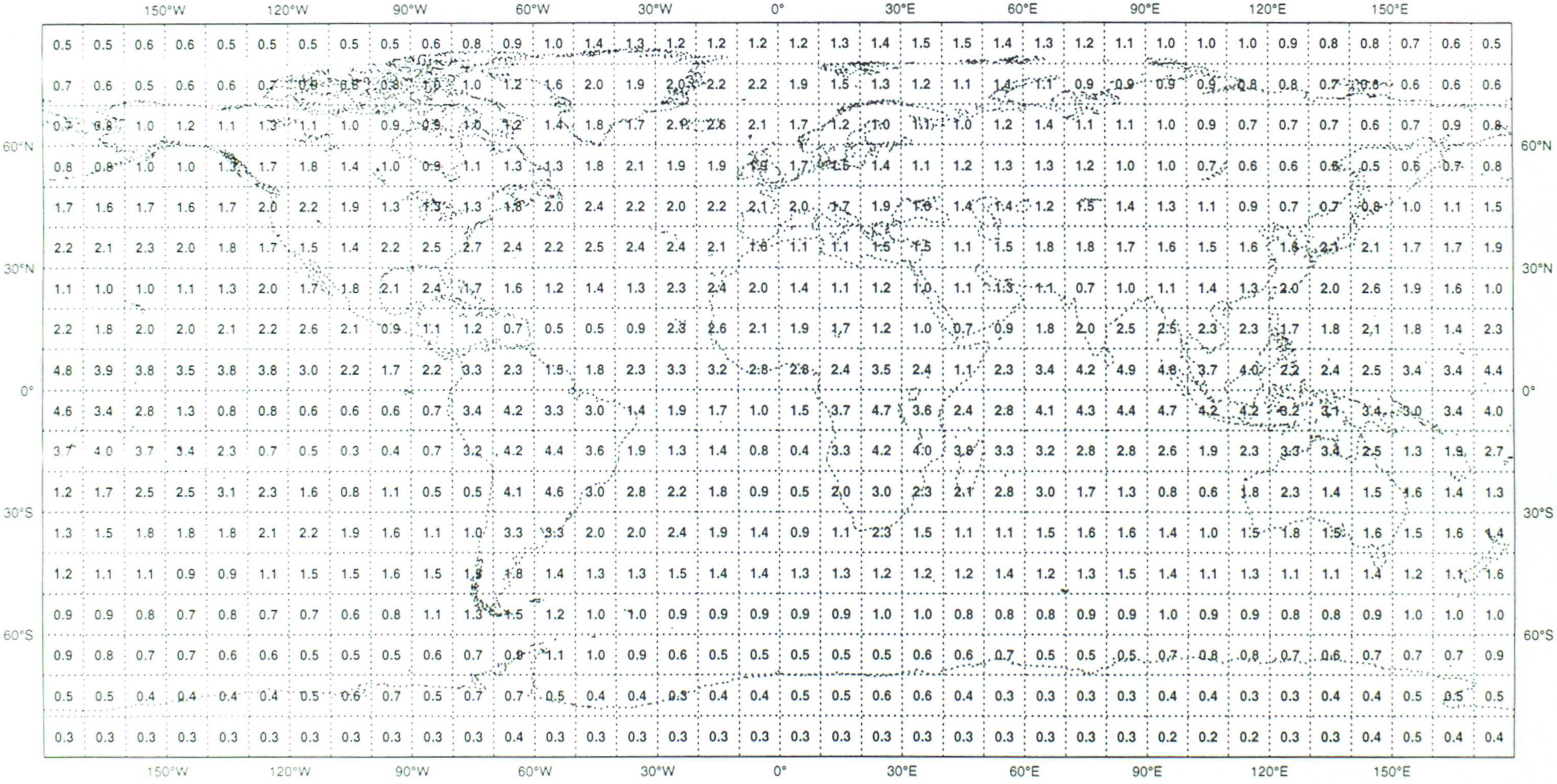
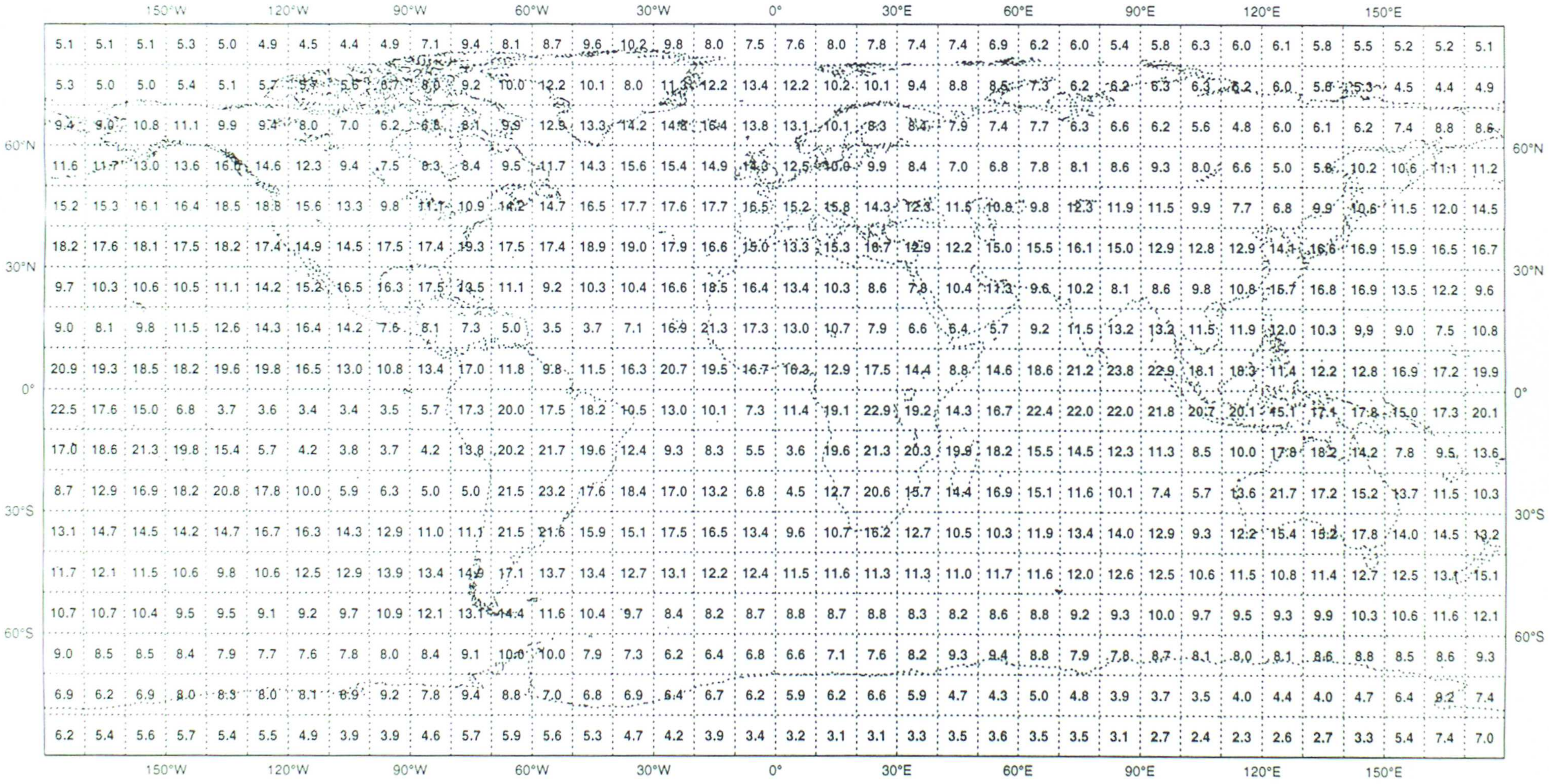
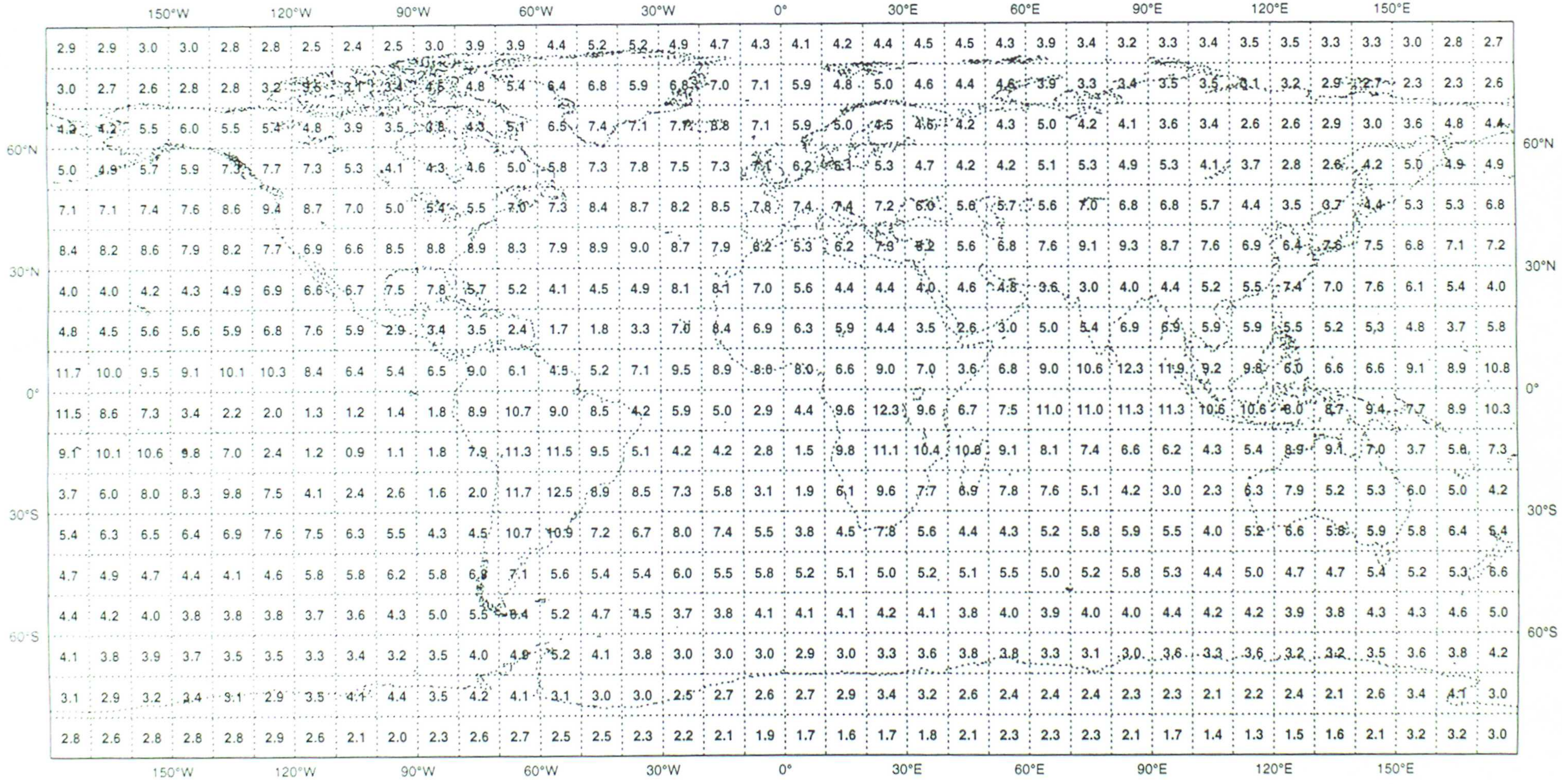

150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S
0.5 0.5 0.6 0.6 0.5 0.5 0.5 0.5 0.5 0.6 0.8 0.9 1.0 1.4 1.3 1.2 1.2 1.2 1.2 1.3 1.4 1.5 1.5 1.4 1.3 1.2 1.1 1.0 1.0 1.0 0.9 0.8 0.8 0.7 0.6 0.5
0.7 0.6 0.5 0.6 0.6 0.7 0.8 0.8 0.8 1.0 1.0 1.2 1.6 2.0 1.9 2.0 2.2 2.2 1.9 1.5 1.3 1.2 1.1 1.4 1.1 0.9 0.9 0.9 0.9 0.8 0.8 0.7 0.6 0.6 0.6 0.6
0.7 0.8 1.0 1.2 1.1 1.3 1.1 1.0 0.9 0.9 1.0 1.2 1.4 1.8 1.7 2.1 2.6 2.1 1.7 1.2 1.0 1.1 1.0 1.2 1.4 1.1 1.1 1.0 0.9 0.7 0.7 0.7 0.6 0.7 0.9 0.8
0.8 0.8 1.0 1.0 1.3 1.7 1.8 1.4 1.0 0.9 1.1 1.3 1.3 1.8 2.1 1.9 1.9 1.9 1.7 1.5 1.4 1.1 1.2 1.3 1.3 1.2 1.0 1.0 0.7 0.6 0.6 0.6 0.5 0.5 0.7 0.8
1.7 1.6 1.7 1.6 1.7 2.0 2.2 1.9 1.3 1.3 1.3 1.8 2.0 2.4 2.2 2.0 2.2 2.1 2.0 1.7 1.9 1.6 1.4 1.4 1.2 1.5 1.4 1.3 1.1 0.9 0.7 0.7 0.8 1.0 1.1 1.5
2.2 2.1 2.3 2.0 1.8 1.7 1.5 1.4 2.2 2.5 2.7 2.4 2.2 2.5 2.4 2.4 2.1 1.6 1.1 1.1 1.5 1.5 1.1 1.5 1.8 1.8 1.7 1.6 1.5 1.6 1.8 2.1 2.1 1.7 1.7 1.9
1.1 1.0 1.0 1.1 1.3 2.0 1.7 1.8 2.1 2.4 1.7 1.6 1.2 1.4 1.3 2.3 2.4 2.0 1.4 1.1 1.2 1.0 1.1 1.3 1.1 0.7 1.0 1.1 1.4 1.3 2.0 2.0 2.6 1.9 1.6 1.0
2.2 1.8 2.0 2.0 2.1 2.2 2.6 2.1 0.9 1.1 1.2 0.7 0.5 0.5 0.9 2.3 2.6 2.1 1.9 1.7 1.2 1.0 0.7 0.9 1.8 2.0 2.5 2.5 2.3 2.3 1.7 1.8 2.1 1.8 1.4 2.3
4.8 3.9 3.8 3.5 3.8 3.8 3.0 2.2 1.7 2.2 3.3 2.3 1.5 1.8 2.3 3.3 3.2 2.8 2.8 2.4 3.5 2.4 1.1 2.3 3.4 4.2 4.9 4.8 3.7 4.0 2.2 2.4 2.5 3.4 3.4 4.4
4.6 3.4 2.8 1.3 0.8 0.8 0.6 0.6 0.6 0.7 3.4 4.2 3.3 3.0 1.4 1.9 1.7 1.0 1.5 3.7 4.7 3.6 2.4 2.8 4.1 4.3 4.4 4.7 4.2 4.2 3.2 3.1 3.4 3.0 3.4 4.0
3.7 4.0 3.7 3.4 2.3 0.7 0.5 0.3 0.4 0.7 3.2 4.2 4.4 3.6 1.9 1.3 1.4 0.8 0.4 3.3 4.2 4.0 3.8 3.3 3.2 2.8 2.8 2.6 1.9 2.3 3.3 3.4 2.5 1.3 1.9 2.7
1.2 1.7 2.5 2.5 3.1 2.3 1.6 0.8 1.1 0.5 0.5 4.1 4.6 3.0 2.8 2.2 1.8 0.9 0.5 2.0 3.0 2.3 2.1 2.8 3.0 1.7 1.3 0.8 0.6 1.8 2.3 1.4 1.5 1.6 1.4 1.3
1.3 1.5 1.8 1.8 1.8 2.1 2.2 1.9 1.6 1.1 1.0 3.3 3.3 2.0 2.0 2.4 1.9 1.4 0.9 1.1 2.3 1.5 1.1 1.1 1.5 1.6 1.6 1.4 1.0 1.5 1.8 1.5 1.6 1.5 1.6 1.4
1.2 1.1 1.1 0.9 0.9 1.1 1.5 1.5 1.6 1.5 1.8 1.8 1.4 1.3 1.3 1.5 1.4 1.4 1.3 1.3 1.2 1.2 1.2 1.4 1.2 1.3 1.5 1.4 1.1 1.3 1.1 1.1 1.4 1.2 1.1 1.6
0.9 0.9 0.8 0.7 0.8 0.7 0.7 0.6 0.8 1.1 1.3 1.5 1.2 1.0 1.0 0.9 0.9 0.9 0.9 0.9 1.0 1.0 0.8 0.8 0.8 0.9 0.9 1.0 0.9 0.9 0.8 0.8 0.9 1.0 1.0 1.0
0.9 0.8 0.7 0.7 0.6 0.6 0.5 0.5 0.5 0.6 0.7 0.8 1.1 1.0 0.9 0.6 0.5 0.5 0.5 0.5 0.5 0.6 0.6 0.7 0.5 0.5 0.5 0.7 0.8 0.8 0.7 0.6 0.7 0.7 0.7 0.9
0.5 0.5 0.4 0.4 0.4 0.4 0.5 0.6 0.7 0.5 0.7 0.7 0.5 0.4 0.4 0.3 0.4 0.4 0.5 0.5 0.6 0.6 0.4 0.3 0.3 0.3 0.3 0.4 0.4 0.3 0.3 0.4 0.4 0.5 0.5 0.5
0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.4 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.3 0.2 0.2 0.2 0.3 0.3 0.4 0.5 0.4 0.4
150°W
120°W
90°W
60°W
30°W
0°
30°E
60°E
90°E
120°E
150°E
60°N
30°N
0°
30°S
60°S

Figure 64. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-5 (700 hPa)
NOAA17, using all observations



5.1	5.1	5.1	5.3	5.0	4.9	4.5	4.4	4.9	7.1	9.4	8.1	8.7	9.6	10.2	9.8	8.0	7.5	7.6	8.0	7.8	7.4	7.4	6.9	6.2	6.0	5.4	5.8	6.3	6.0	6.1	5.8	5.5	5.2	5.2	5.1
5.3	5.0	5.0	5.4	5.1	5.7	5.7	5.6	6.7	8.0	9.2	10.0	12.2	10.1	8.0	11.3	12.2	13.4	12.2	10.2	10.1	9.4	8.8	8.5	7.3	6.2	6.2	6.3	6.3	6.2	6.0	5.8	5.3	4.5	4.4	4.9
9.4	9.0	10.8	11.1	9.9	9.4	8.0	7.0	6.2	6.8	8.1	9.9	12.9	13.3	14.2	14.8	16.4	13.8	13.1	10.1	8.3	8.4	7.9	7.4	7.7	6.3	6.6	6.2	5.6	4.8	6.0	6.1	6.2	7.4	8.8	8.6
11.6	11.7	13.0	13.6	16.0	14.6	12.3	9.4	7.5	8.3	8.4	9.5	11.7	14.3	15.6	15.4	14.9	14.3	12.5	10.0	9.9	8.4	7.0	6.8	7.8	8.1	8.6	9.3	8.0	6.6	5.0	5.8	10.2	10.6	11.1	11.2
15.2	15.3	16.1	16.4	18.5	18.8	15.6	13.3	9.8	11.1	10.9	14.2	14.7	16.5	17.7	17.6	17.7	16.5	15.2	15.8	14.3	12.3	11.5	10.8	9.8	12.3	11.9	11.5	9.9	7.7	6.8	9.9	10.6	11.5	12.0	14.5
18.2	17.6	18.1	17.5	18.2	17.4	14.9	14.5	17.5	17.4	19.3	17.5	17.4	18.9	19.0	17.9	16.6	15.0	13.3	15.3	16.7	12.9	12.2	15.0	15.5	16.1	15.0	12.9	12.8	12.9	14.1	16.6	16.9	15.9	16.5	16.7
9.7	10.3	10.6	10.5	11.1	14.2	15.2	16.5	16.3	17.5	13.5	11.1	9.2	10.3	10.4	16.6	18.5	16.4	13.4	10.3	8.6	7.8	10.4	11.3	9.6	10.2	8.1	8.6	9.8	10.8	15.7	16.8	16.9	13.5	12.2	9.6
9.0	8.1	9.8	11.5	12.6	14.3	16.4	14.2	7.6	8.1	7.3	5.0	3.5	3.7	7.1	16.9	21.3	17.3	13.0	10.7	7.9	6.6	6.4	5.7	9.2	11.5	13.2	13.2	11.5	11.9	12.0	10.3	9,9	9.0	7.5	10.8
20.9	19.3	18.5	18.2	19.6	19.8	16.5	13.0	10.8	13.4	17.0	11.8	9.8	11.5	16.3	20.7	19.5	16.7	16.3	12.9	17.5	14.4	8.8	14.6	18.6	21.2	23.8	22.9	18.1	18.3	11.4	12.2	12.8	16.9	17.2	19.9
22.5	17.6	15.0	6.8	3.7	3.6	3.4	3.4	3.5	5.7	17.3	20.0	17.5	18.2	10.5	13.0	10.1	7.3	11.4	19.1	22.9	19.2	14.3	16.7	22.4	22.0	22.0	21.8	20.7	20.1	15.1	17.1	17.8	15.0	17.3	20.1
17.0	18.6	21.3	19.8	15.4	5.7	4.2	3.8	3.7	4.2	13.8	20.2	21.7	19.6	12.4	9.3	8.3	5.5	3.6	19.6	21.3	20.3	19.9	18.2	15.5	14.5	12.3	11.3	8.5	10.0	17.8	18.2	14.2	7.8	9.5	13.6
8.7	12.9	16.9	18.2	20.8	17.8	10.0	5.9	6.3	5.0	5.0	21.5	23.2	17.6	18.4	17.0	13.2	6.8	4.5	12.7	20.6	15.7	14.4	16.9	15.1	11.6	10.1	7.4	5.7	13.6	21.7	17.2	15.2	13.7	11.5	10.3
13.1	14.7	14.5	14.2	14.7	16.7	16.3	14.3	12.9	11.0	11.1	21.5	21.6	15.9	15.1	17.5	16.5	13.4	9.6	10.7	16.2	12.7	10.5	10.3	11.9	13.4	14.0	12.9	9.3	12.2	15.4	15.2	17.8	14.0	14.5	13.2
11.7	12.1	11.5	10.6	9.8	10.6	12.5	12.9	13.9	13.4	14.9	17.1	13.7	13.4	12.7	13.1	12.2	12.4	11.5	11.6	11.3	11.3	11.0	11.7	11.6	12.0	12.6	12.5	10.6	11.5	10.8	11.4	12.7	12.5	13.1	15.1
10.7	10.7	10.4	9.5	9.5	9.1	9.2	9.7	10.9	12.1	13.1	14.4	11.6	10.4	9.7	8.4	8.2	8.7	8.8	8.7	8.8	8.3	8.2	8.6	8.8	9.2	9.3	10.0	9.7	9.5	9.3	9.9	10.3	10.6	11.6	12.1
9.0	8.5	8.5	8.4	7.9	7.7	7.6	7.8	8.0	8.4	9.1	10.0	10.0	7.9	7.3	6.2	6.4	6.8	6.6	7.1	7.6	8.2	9.3	9.4	8.8	7.9	7.8	8.7	8.1	8.0	8.1	8.6	8.8	8.5	8.6	9.3
6.9	6.2	6.9	8.0	8.3	8.0	8.1	8.9	9.2	7.8	9.4	8.8	7.0	6.8	6.9	6.4	6.7	6.2	5.9	6.2	6.6	5.9	4.7	4.3	5.0	4.8	3.9	3.7	3.5	4.0	4.4	4.0	4.7	6.4	9.2	7.4
6.2	5.4	5.6	5.7	5.4	5.5	4.9	3.9	3.9	4.6	5.7	5.9	5.6	5.3	4.7	4.2	3.9	3.4	3.2	3.1	3.1	3.3	3.5	3.6	3.5	3.5	3.1	2.7	2.4	2.3	2.6	2.7	3.3	5.4	7.4	7.0

Figure 65. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-5 (700 hPa)
NOAA17, using all observations



2.9	2.9	3.0	3.0	2.8	2.8	2.5	2.4	2.5	3.0	3.9	3.9	4.4	5.2	5.2	4.9	4.7	4.3	4.1	4.2	4.4	4.5	4.5	4.3	3.9	3.4	3.2	3.3	3.4	3.5	3.5	3.3	3.3	3.0	2.8	2.7
3.0	2.7	2.6	2.8	2.8	3.2	3.6	3.1	3.4	4.5	4.8	5.4	6.4	6.8	5.9	6.8	7.0	7.1	5.9	4.8	5.0	4.6	4.4	4.6	3.9	3.3	3.4	3.5	3.5	3.1	3.2	2.9	2.7	2.3	2.3	2.6
4.2	4.2	5.5	6.0	5.5	5.4	4.8	3.9	3.5	3.8	4.3	5.1	6.5	7.4	7.1	7.7	8.8	7.1	5.9	5.0	4.5	4.6	4.2	4.3	5.0	4.2	4.1	3.6	3.4	2.6	2.6	2.9	3.0	3.6	4.8	4.4
5.0	4.9	5.7	5.9	7.3	7.7	7.3	5.3	4.1	4.3	4.6	5.0	5.8	7.3	7.8	7.5	7.3	7.1	6.2	6.1	5.3	4.7	4.2	4.2	5.1	5.3	4.9	5.3	4.1	3.7	2.8	2.6	4.2	5.0	4.9	4.9
7.1	7.1	7.4	7.6	8.6	9.4	8.7	7.0	5.0	5.4	5.5	7.0	7.3	8.4	8.7	8.2	8.5	7.8	7.4	7.4	7.2	6.0	5.6	5.7	5.6	7.0	6.8	6.8	5.7	4.4	3.5	3.7	4.4	5.3	5.3	6.8
8.4	8.2	8.6	7.9	8.2	7.7	6.9	6.6	8.5	8.8	8.9	8.3	7.9	8.9	9.0	8.7	7.9	8.2	5.3	6.2	7.3	8.2	5.6	6.8	7.6	9.1	9.3	8.7	7.6	6.9	6.4	7.6	7.5	6.8	7.1	7.2
4.0	4.0	4.2	4.3	4.9	6.9	6.6	6.7	7.5	7.8	5.7	5.2	4.1	4.5	4.9	8.1	8.1	7.0	5.6	4.4	4.4	4.0	4.6	4.8	3.6	3.0	4.0	4.4	5.2	5.5	7.4	7.0	7.6	6.1	5.4	4.0
4.8	4.5	5.6	5.6	5.9	6.8	7.6	5.9	2.9	3.4	3.5	2.4	1.7	1.8	3.3	7.0	8.4	6.9	6.3	5.9	4.4	3.5	2.6	3.0	5.0	5.4	6.9	6.9	5.9	5.9	5.5	5.2	5.3	4.8	3.7	5.8
11.7	10.0	9.5	9.1	10.1	10.3	8.4	6.4	5.4	6.5	9.0	6.1	4.5	5.2	7.1	9.5	8.9	8.6	8.0	6.6	9.0	7.0	3.6	6.8	9.0	10.6	12.3	11.9	9.2	9.8	6.0	6.6	6.6	9.1	8.9	10.8
11.5	8.6	7.3	3.4	2.2	2.0	1.3	1.2	1.4	1.8	8.9	10.7	9.0	8.5	4.2	5.9	5.0	2.9	4.4	9.6	12.3	9.6	6.7	7.5	11.0	11.0	11.3	11.3	10.6	10.6	8.0	8.7	9.4	7.7	8.9	10.3
9.1	10.1	10.6	9.8	7.0	2.4	1.2	0.9	1.1	1.8	7.9	11.3	11.5	9.5	5.1	4.2	4.2	2.8	1.5	9.8	11.1	10.4	10.6	9.1	8.1	7.4	6.6	6.2	4.3	5.4	8.9	9.1	7.0	3.7	5.8	7.3
3.7	6.0	8.0	8.3	9.8	7.5	4.1	2.4	2.6	1.6	2.0	11.7	12.5	8.9	8.5	7.3	5.8	3.1	1.9	6.1	9.6	7.7	6.9	7.8	7.6	5.1	4.2	3.0	2.3	6.3	7.9	5.2	5.3	6.0	5.0	4.2
5.4	6.3	6.5	6.4	6.9	7.6	7.5	6.3	5.5	4.3	4.5	10.7	10.9	7.2	6.7	8.0	7.4	5.5	3.8	4.5	7.8	5.6	4.4	4.3	5.2	5.8	5.9	5.5	4.0	5.2	6.6	5.8	5.9	5.8	6.4	5.4
4.7	4.9	4.7	4.4	4.1	4.6	5.8	5.8	6.2	5.8	6.8	7.1	5.6	5.4	5.4	6.0	5.5	5.8	5.2	5.1	5.0	5.2	5.1	5.5	5.0	5.2	5.8	5.3	4.4	5.0	4.7	4.7	5.4	5.2	5.3	6.6
4.4	4.2	4.0	3.8	3.8	3.8	3.7	3.6	4.3	5.0	5.5	6.4	5.2	4.7	4.5	3.7	3.8	4.1	4.1	4.1	4.2	4.1	3.8	4.0	3.9	4.0	4.0	4.4	4.2	4.2	3.9	3.8	4.3	4.3	4.6	5.0
4.1	3.8	3.9	3.7	3.5	3.5	3.3	3.4	3.2	3.5	4.0	4.9	5.2	4.1	3.8	3.0	3.0	3.0	2.9	3.0	3.3	3.6	3.8	3.8	3.3	3.1	3.0	3.6	3.3	3.6	3.2	3.2	3.5	3.6	3.8	4.2
3.1	2.9	3.2	3.4	3.1	2.9	3.5	4.1	4.4	3.5	4.2	4.1	3.1	3.0	3.0	2.5	2.7	2.6	2.7	2.9	3.4	3.2	2.6	2.4	2.4	2.4	2.3	2.3	2.1	2.2	2.4	2.1	2.6	3.4	4.1	3.0
2.8	2.6	2.8	2.8	2.8	2.9	2.6	2.1	2.0	2.3	2.6	2.7	2.5	2.5	2.3	2.2	2.1	1.9	1.7	1.6	1.7	1.8	2.1	2.3	2.3	2.3	2.1	1.7	1.4	1.3	1.5	1.6	2.1	3.2	3.2	3.0

Figure 66. ATOVS MEAN O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-7 (300 hPa)
NOAA17, using all observations

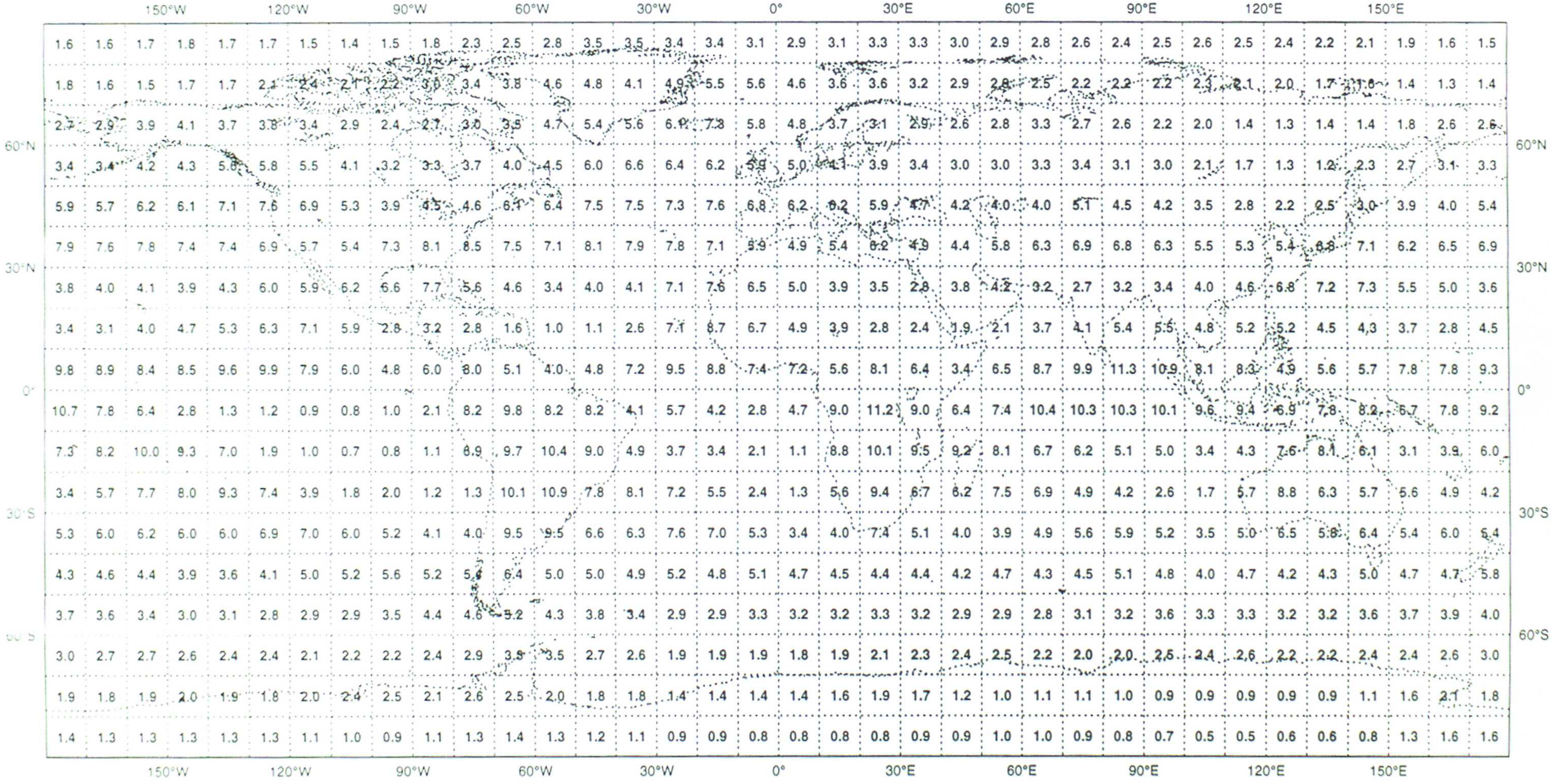
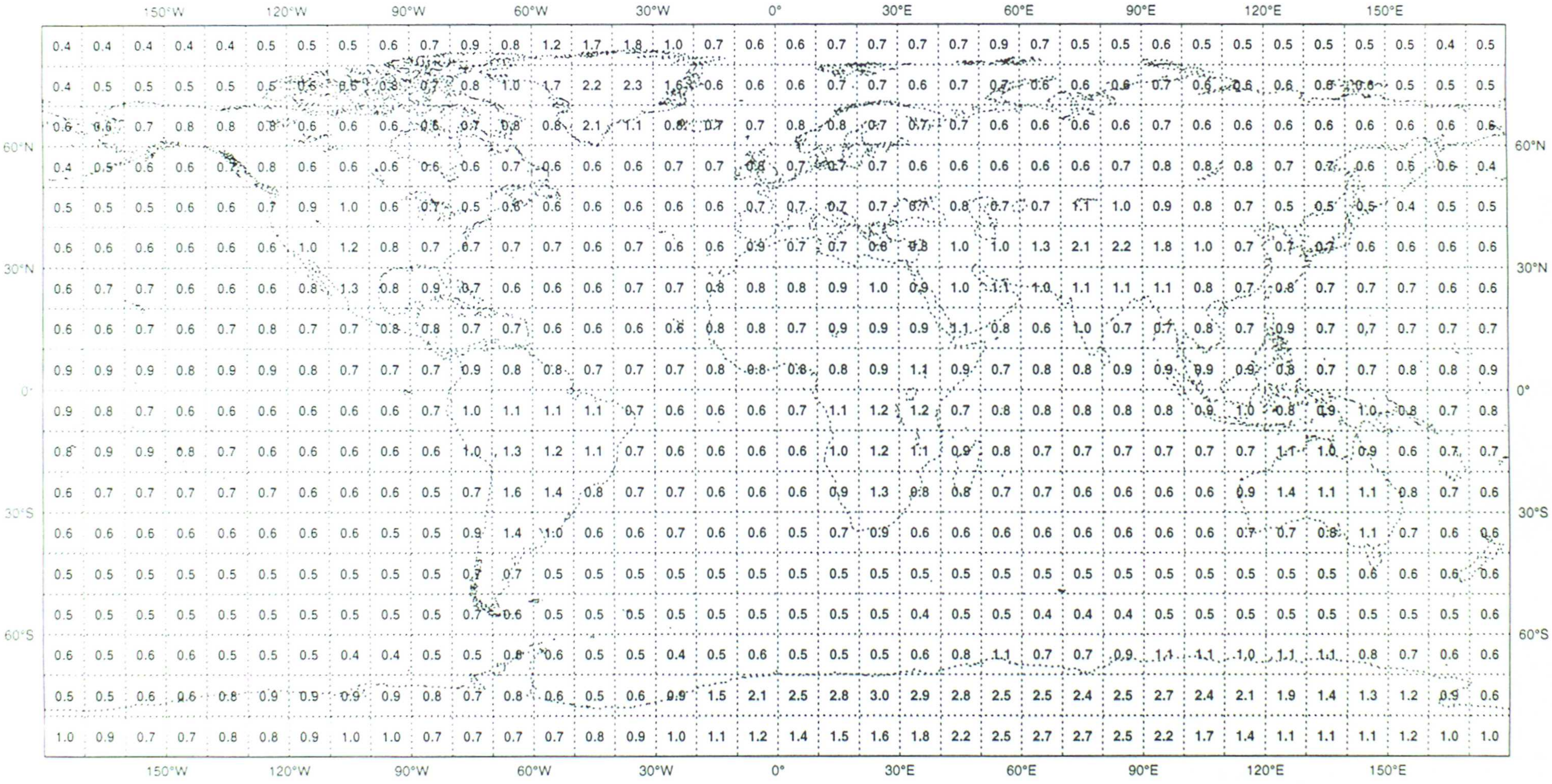
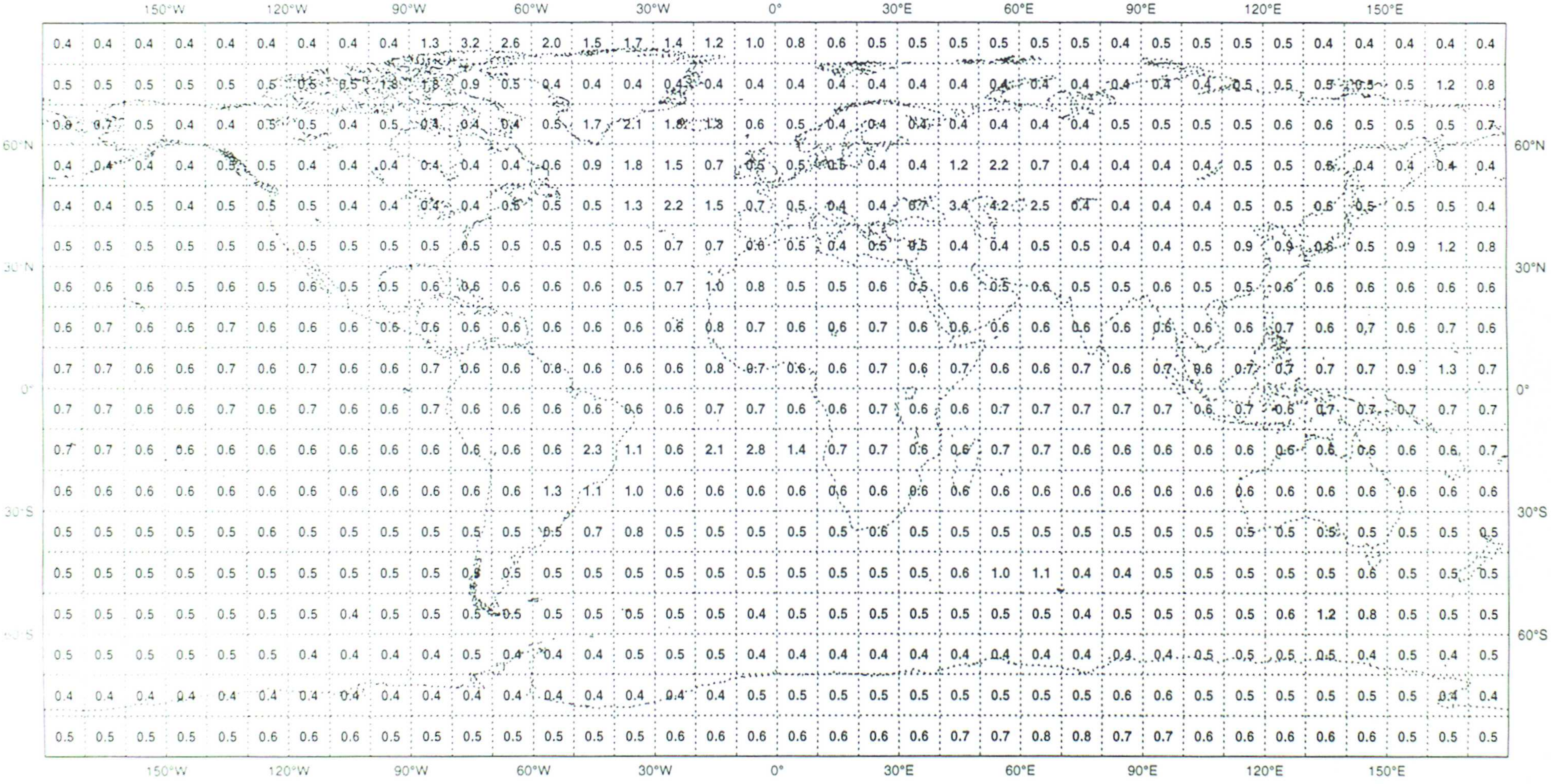

150°W 120°W 90°W 60°W 30°W 0° 30°E 60°E 90°E 120°E 150°E
60°N 30°N 0° 30°S 60°S
1.6 1.6 1.7 1.8 1.7 1.7 1.5 1.4 1.5 1.8 2.3 2.5 2.8 3.5 3.5 3.4 3.4 3.1 2.9 3.1 3.3 3.3 3.0 2.9 2.8 2.6 2.4 2.5 2.6 2.5 2.4 2.2 2.1 1.9 1.6 1.5
1.8 1.6 1.5 1.7 1.7 2.1 2.4 2.1 2.2 3.0 3.4 3.8 4.6 4.8 4.1 4.9 5.5 5.6 4.6 3.6 3.6 3.2 2.9 2.8 2.5 2.2 2.2 2.2 2.3 2.1 2.0 1.7 1.6 1.4 1.3 1.4
2.7 2.9 3.9 4.1 3.7 3.8 3.4 2.9 2.4 2.7 3.0 3.5 4.7 5.4 5.6 6.1 7.3 5.8 4.8 3.7 3.1 2.9 2.6 2.8 3.3 2.7 2.6 2.2 2.0 1.4 1.3 1.4 1.4 1.8 2.6 2.6
3.4 3.4 4.2 4.3 5.6 5.8 5.5 4.1 3.2 3.3 3.7 4.0 4.5 6.0 6.6 6.4 6.2 5.9 5.0 4.1 3.9 3.4 3.0 3.0 3.3 3.4 3.1 3.0 2.1 1.7 1.3 1.2 2.3 2.7 3.1 3.3
5.9 5.7 6.2 6.1 7.1 7.6 6.9 5.3 3.9 4.5 4.6 6.1 6.4 7.5 7.5 7.3 7.6 6.8 6.2 6.2 5.9 4.7 4.2 4.0 4.0 5.1 4.5 4.2 3.5 2.8 2.2 2.5 3.0 3.9 4.0 5.4
7.9 7.6 7.8 7.4 7.4 6.9 5.7 5.4 7.3 8.1 8.5 7.5 7.1 8.1 7.9 7.8 7.1 5.9 4.9 5.4 6.2 4.9 4.4 5.8 6.3 6.9 6.8 6.3 5.5 5.3 5.4 6.8 7.1 6.2 6.5 6.9
3.8 4.0 4.1 3.9 4.3 6.0 5.9 6.2 6.6 7.7 5.6 4.6 3.4 4.0 4.1 7.1 7.6 6.5 5.0 3.9 3.5 2.8 3.8 4.2 3.2 2.7 3.2 3.4 4.0 4.6 6.8 7.2 7.3 5.5 5.0 3.6
3.4 3.1 4.0 4.7 5.3 6.3 7.1 5.9 2.8 3.2 2.8 1.6 1.0 1.1 2.6 7.1 8.7 6.7 4.9 3.9 2.8 2.4 1.9 2.1 3.7 4.1 5.4 5.5 4.8 5.2 5.2 4.5 4.3 3.7 2.8 4.5
9.8 8.9 8.4 8.5 9.6 9.9 7.9 6.0 4.8 6.0 8.0 5.1 4.0 4.8 7.2 9.5 8.8 7.4 7.2 5.6 8.1 6.4 3.4 6.5 8.7 9.9 11.3 10.9 8.1 8.3 4.9 5.6 5.7 7.8 7.8 9.3
10.7 7.8 6.4 2.8 1.3 1.2 0.9 0.8 1.0 2.1 8.2 9.8 8.2 8.2 4.1 5.7 4.2 2.8 4.7 9.0 11.2 9.0 6.4 7.4 10.4 10.3 10.3 10.1 9.6 9.4 6.9 7.8 8.2 6.7 7.8 9.2
7.3 8.2 10.0 9.3 7.0 1.9 1.0 0.7 0.8 1.1 6.9 9.7 10.4 9.0 4.9 3.7 3.4 2.1 1.1 8.8 10.1 9.5 9.2 8.1 6.7 6.2 5.1 5.0 3.4 4.3 7.6 8.1 6.1 3.1 3.9 6.0
3.4 5.7 7.7 8.0 9.3 7.4 3.9 1.8 2.0 1.2 1.3 10.1 10.9 7.8 8.1 7.2 5.5 2.4 1.3 5.6 9.4 6.7 6.2 7.5 6.9 4.9 4.2 2.6 1.7 5.7 8.8 6.3 5.7 5.6 4.9 4.2
5.3 6.0 6.2 6.0 6.0 6.9 7.0 6.0 5.2 4.1 4.0 9.5 9.5 6.6 6.3 7.6 7.0 5.3 3.4 4.0 7.4 5.1 4.0 3.9 4.9 5.6 5.9 5.2 3.5 5.0 6.5 5.8 6.4 5.4 6.0 5.4
4.3 4.6 4.4 3.9 3.6 4.1 5.0 5.2 5.6 5.2 5.4 6.4 5.0 5.0 4.9 5.2 4.8 5.1 4.7 4.5 4.4 4.4 4.2 4.7 4.3 4.5 5.1 4.8 4.0 4.7 4.2 4.3 5.0 4.7 4.7 5.8
3.7 3.6 3.4 3.0 3.1 2.8 2.9 2.9 3.5 4.4 4.6 5.2 4.3 3.8 3.4 2.9 2.9 3.3 3.2 3.2 3.3 3.2 2.9 2.9 2.8 3.1 3.2 3.6 3.3 3.3 3.2 3.2 3.6 3.7 3.9 4.0
3.0 2.7 2.7 2.6 2.4 2.4 2.1 2.2 2.2 2.4 2.9 3.8 3.5 2.7 2.6 1.9 1.9 1.9 1.8 1.9 2.1 2.3 2.4 2.5 2.2 2.0 2.0 2.5 2.4 2.6 2.2 2.2 2.4 2.4 2.6 3.0
1.9 1.8 1.9 2.0 1.9 1.8 2.0 2.4 2.5 2.1 2.6 2.5 2.0 1.8 1.8 1.4 1.4 1.4 1.4 1.6 1.9 1.7 1.2 1.0 1.1 1.1 1.0 0.9 0.9 0.9 0.9 0.9 1.1 1.6 2.1 1.8
1.4 1.3 1.3 1.3 1.3 1.3 1.1 1.0 0.9 1.1 1.3 1.4 1.3 1.2 1.1 0.9 0.9 0.8 0.8 0.8 0.8 0.9 0.9 1.0 1.0 0.9 0.8 0.7 0.5 0.5 0.6 0.6 0.8 1.3 1.6 1.6

Figure 67. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-7 (300 hPa)
NOAA17, using all observations



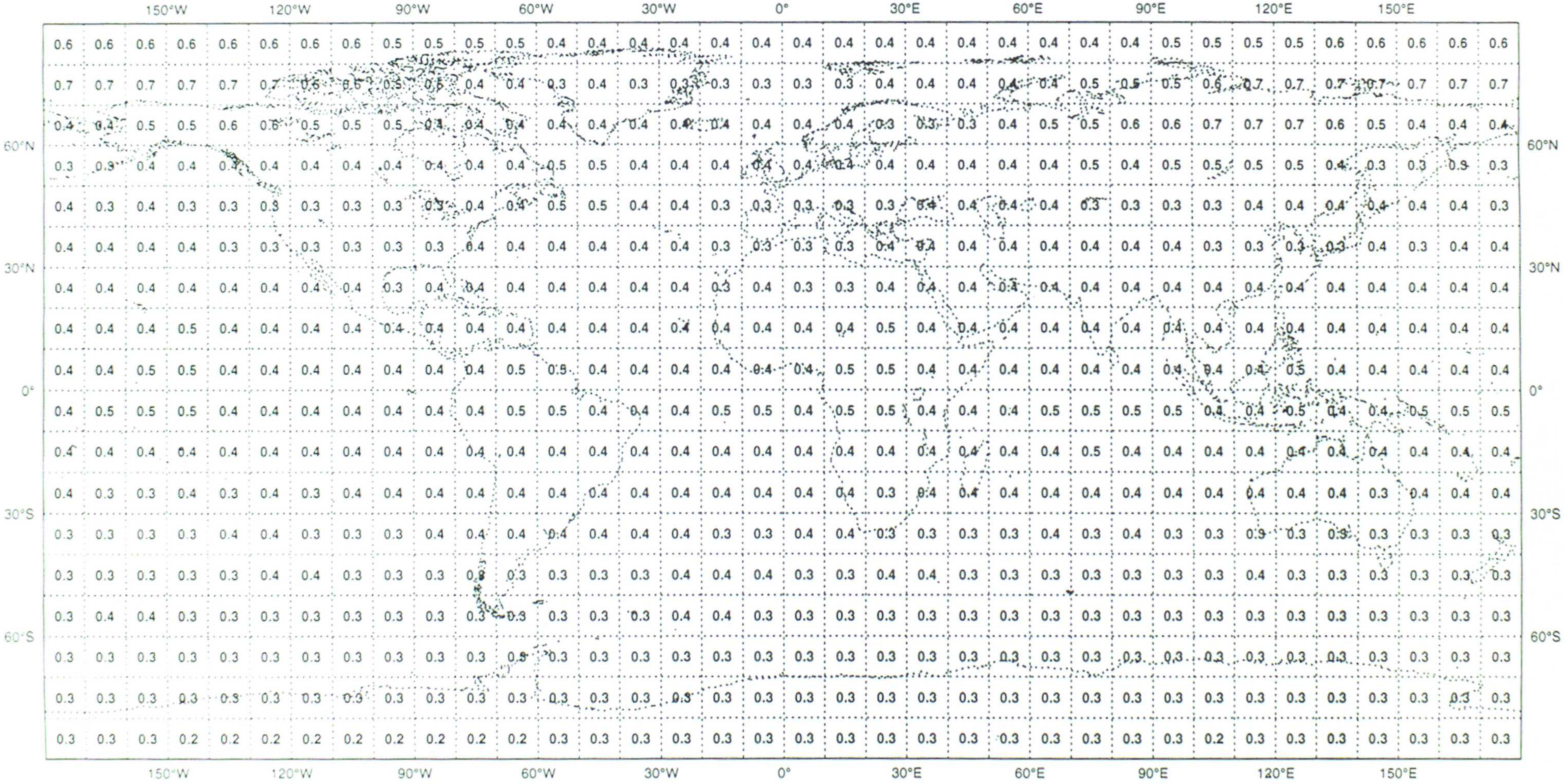
0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.9	0.8	1.2	1.7	1.8	1.0	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.9	0.7	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5
0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.8	0.7	0.8	1.0	1.7	2.2	2.3	1.6	0.6	0.6	0.6	0.7	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5
0.6	0.6	0.7	0.8	0.8	0.8	0.6	0.6	0.6	0.6	0.7	0.8	0.8	2.1	1.1	0.8	0.7	0.7	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
0.4	0.5	0.6	0.6	0.7	0.8	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.7	0.7	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.7	0.8	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.4
0.5	0.5	0.5	0.6	0.6	0.7	0.9	1.0	0.6	0.7	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.7	0.7	1.1	1.0	0.9	0.8	0.7	0.5	0.5	0.5	0.4	0.5	0.5
0.6	0.6	0.6	0.6	0.6	0.6	1.0	1.2	0.8	0.7	0.7	0.7	0.7	0.6	0.7	0.6	0.6	0.9	0.7	0.7	0.6	0.8	1.0	1.0	1.3	2.1	2.2	1.8	1.0	0.7	0.7	0.7	0.6	0.6	0.6	0.6
0.6	0.7	0.7	0.6	0.6	0.6	0.8	1.3	0.8	0.9	0.7	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	1.0	0.9	1.0	1.1	1.0	1.1	1.1	1.1	0.8	0.7	0.8	0.7	0.7	0.7	0.6	0.6
0.6	0.6	0.7	0.6	0.7	0.8	0.7	0.7	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.8	0.8	0.7	0.9	0.9	0.9	1.1	0.8	0.6	1.0	0.7	0.7	0.8	0.7	0.9	0.7	0.7	0.7	0.7	0.7
0.9	0.9	0.9	0.8	0.9	0.9	0.8	0.7	0.7	0.7	0.9	0.8	0.8	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	1.1	0.9	0.7	0.8	0.8	0.9	0.9	0.9	0.9	0.8	0.7	0.7	0.8	0.8	0.9
0.9	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	1.0	1.1	1.1	1.1	0.7	0.6	0.6	0.6	0.7	1.1	1.2	1.2	0.7	0.8	0.8	0.8	0.8	0.8	0.9	1.0	0.8	0.9	1.0	0.8	0.7	0.8
0.8	0.9	0.9	0.8	0.7	0.6	0.6	0.6	0.6	0.6	1.0	1.3	1.2	1.1	0.7	0.6	0.6	0.6	0.6	1.0	1.2	1.1	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7	1.1	1.0	0.9	0.6	0.7	0.7
0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.7	1.6	1.4	0.8	0.7	0.7	0.6	0.6	0.6	0.9	1.3	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.9	1.4	1.1	1.1	0.8	0.7	0.6
0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.9	1.4	1.0	0.6	0.6	0.7	0.6	0.6	0.5	0.7	0.9	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8	1.1	0.7	0.6	0.6
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6
0.6	0.5	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.5	0.5	0.8	0.6	0.5	0.5	0.4	0.5	0.6	0.5	0.5	0.5	0.6	0.8	1.1	0.7	0.7	0.9	1.1	1.1	1.0	1.1	1.1	0.8	0.7	0.6	0.6
0.5	0.5	0.6	0.6	0.8	0.9	0.9	0.9	0.9	0.8	0.7	0.8	0.6	0.5	0.6	0.9	1.5	2.1	2.5	2.8	3.0	2.9	2.8	2.5	2.5	2.4	2.5	2.7	2.4	2.1	1.9	1.4	1.3	1.2	0.9	0.6
1.0	0.9	0.7	0.7	0.8	0.8	0.9	1.0	1.0	0.7	0.7	0.7	0.7	0.8	0.9	1.0	1.1	1.2	1.4	1.5	1.6	1.8	2.2	2.5	2.7	2.7	2.5	2.2	1.7	1.4	1.1	1.1	1.1	1.2	1.0	1.0

Figure 68. ATOVS MEAN O-B brightness temperature differences (deg C). **DECEMBER 2002**
Channel: AMSUA-9 (100 hPa)
NOAA17, using all observations



0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	1.3	3.2	2.6	2.0	1.5	1.7	1.4	1.2	1.0	0.8	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.3	1.8	0.9	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	1.2	0.8
0.8	0.7	0.5	0.4	0.4	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.5	1.7	2.1	1.8	1.8	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.7
0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.6	0.9	1.8	1.5	0.7	0.5	0.5	0.5	0.4	0.4	1.2	2.2	0.7	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.4	0.4	0.4	0.4
0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.5	1.3	2.2	1.5	0.7	0.5	0.4	0.4	0.7	3.4	4.2	2.5	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.5	0.5	0.5	0.4
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.7	0.6	0.5	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.4	0.4	0.5	0.9	0.9	0.6	0.5	0.9	1.2	0.8
0.6	0.6	0.6	0.5	0.6	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.7	1.0	0.8	0.5	0.5	0.6	0.5	0.6	0.5	0.6	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.7	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.7	0.6	0.7	0.6
0.7	0.7	0.6	0.6	0.7	0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.8	0.6	0.6	0.6	0.8	0.7	0.6	0.6	0.7	0.6	0.7	0.6	0.6	0.7	0.6	0.7	0.6	0.7	0.7	0.7	0.7	0.9	1.3	0.7
0.7	0.7	0.6	0.6	0.7	0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.6	0.6	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.6	0.7	0.6	0.7	0.7	0.7	0.7	0.7
0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	2.3	1.1	0.6	2.1	2.8	1.4	0.7	0.7	0.6	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7
0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	1.3	1.1	1.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.7	0.8	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	1.0	1.1	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5
0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.6	1.2	0.8	0.5	0.5	0.5
0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.5
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4
0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5

Figure 69. ATOVS SD O-B brightness temperature differences (deg C). DECEMBER 2002
Channel: AMSUA-9 (100 hPa)
NOAA17, using all observations



0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.6	0.4	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
0.4	0.4	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.6	0.5	0.4	0.4	0.4
0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.3	0.3	0.3	0.3
0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3
0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.4
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4
0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.5	0.4	0.4	0.5	0.5	0.5
0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.4	0.3	0.3	0.4	0.3	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.4	0.4	0.4
0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3

TABLE 8

MONTHLY MONITORING OF MARINE SURFACE OBSERVATIONS (COSNA)
DATA TYPE:- DRIFTER
MONITORING CENTRE: BRACKNELL
MONTH: December 2002

Monitoring procedures

Period :One calendar month.

Data monitored :Reports from each unique identifier for drifting buoy.

Area monitored :10°N - 80°N, 85°W - 0°W

Standard of comparison :Background field from UKMO global model.

Position :Average latitude and longitude for period.

Observation times :All hours combined.

Elements monitored :Mean sea-level pressure (hPa)
:Wind speed ($m\ s^{-1}$)
:Wind direction (degrees)

Parameters monitored

:NOBS :Number of observations received excluding duplicates.

:NGE :Number of observations with gross errors.

:PGE :Percentage of observations with gross errors.

:SD :SD of difference of observations from background values excluding those with gross errors.

:BIAS :Mean difference of observations from background values excluding those with gross errors.
N.B. A positive bias indicates the wind observation is veered to the background

:RMS :Root Mean Square difference of observations from background values excluding those with gross errors

GROSS ERROR LIMITS :15 hPa (pressure)
:25 $m\ s^{-1}$ (Vector Wind)

N.B. Observations of wind direction are only included in the wind direction statistics if the observed OR background wind speed > 5 $m\ s^{-1}$

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
41503	16.5	-53.6	P	607	0	9	0.6	-0.9	1.1
41522	17.6	-51.1	P	661	0	13	0.6	-0.4	0.8
41531	28.6	-72.3	P	697	0	11	0.6	0.6	0.8
41532	24.5	-66.8	P	720	0	14	0.6	0.2	0.6
41533	31.3	-75.6	P	645	0	9	0.9	-1.0	1.4
41534	24.7	-66.2	P	708	0	15	0.6	0.2	0.6
41536	20.3	-71.9	P	92	89	100	1.3	13.7	13.8
41537	25.5	-70.2	P	885	0	32	0.6	0.4	0.7
41561	15.8	-75.3	P	396	0	13	0.6	-1.5	1.7
41577	34.7	-76.5	P	732	0	11	0.8	0.0	0.8
41640	39.3	-35.7	P	719	0	70	0.8	2.1	2.3
41647	26.8	-62.2	P	458	0	13	0.6	-0.7	0.9
41648	26.8	-73.1	P	704	0	13	0.6	-0.3	0.7
41649	14.9	-56.5	P	639	0	9	0.7	-1.4	1.5
41650	28.5	-64.4	P	825	0	25	0.6	0.0	0.6
41652	27.9	-64.5	P	648	0	12	0.6	-0.2	0.6
41658	40.0	-46.5	P	702	1	15	1.8	-0.8	2.0
41659	33.2	-25.9	P	702	0	9	0.9	0.5	1.0
41666	34.2	-52.1	P	850	0	24	0.7	0.0	0.7
44504	50.7	-39.3	P	184	70	100	6.5	-3.2	7.2
44511	40.9	-29.6	P	154	36	95	3.3	-10.5	11.0
44549	56.5	-17.4	P	1654	0	58	0.8	-0.6	1.0
44550	57.2	-14.1	P	1484	0	54	1.0	-0.4	1.0
44601	35.3	-43.9	P	657	0	2	1.0	-0.4	1.0
44606	32.0	-53.5	P	697	0	2	1.1	0.3	1.1
44607	38.9	-41.1	P	707	1	3	1.6	0.2	1.7
44608	37.3	-37.8	P	707	0	2	1.4	0.7	1.5
44609	50.5	-25.9	P	716	0	6	1.1	-0.5	1.2
44610	43.3	-50.1	P	1134	0	39	1.6	-0.4	1.6
44611	49.4	-46.4	P	1219	1	44	1.4	-0.1	1.4
44612	47.2	-43.3	P	464	0	1	0.9	0.0	0.9
44613	51.8	-46.3	P	183	0	1	0.9	-0.5	1.1
44614	57.4	-40.4	P	194	0	8	1.5	0.3	1.6
44616	40.4	-14.5	P	685	0	0	0.8	-0.5	0.9
44625	29.3	-23.0	P	617	0	19	1.8	-0.3	1.8
44627	36.0	-17.9	P	644	0	0	0.7	-0.7	1.0
44721	32.8	-47.1	P	706	0	0	0.7	-0.3	0.7
44723	43.9	-19.0	P	682	0	2	1.0	0.3	1.1
44726	59.1	-33.4	P	1442	0	51	1.1	0.3	1.1
44730	63.9	-22.6	P	1433	0	55	1.5	-0.3	1.6
44763	41.4	-14.5	P	773	0	10	0.7	0.1	0.7
44764	53.8	-23.6	P	1266	0	45	1.1	0.0	1.1
44767	50.5	-22.1	P	1102	0	39	0.9	0.0	0.9
44768	41.9	-49.3	P	224	0	7	1.3	1.6	2.1
44769	57.4	-31.7	P	1436	0	51	1.1	-0.5	1.2
44772	62.5	-34.9	P	461	0	9	1.0	-0.3	1.0
44773	43.4	-26.1	P	658	0	3	1.4	0.5	1.5
44774	44.4	-45.3	P	194	0	20	2.1	-0.7	2.2
44776	46.8	-38.6	P	28	18	89	7.0	5.9	9.2
44780	61.0	-27.2	P	586	0	40	0.9	0.1	0.9
47554	73.1	-76.3	P	522	0	31	1.1	0.0	1.1
48589	79.2	-10.1	P	356	0	2	1.6	-0.1	1.6
62501	28.8	-38.6	P	686	0	0	0.6	0.3	0.7
62503	29.6	-41.6	P	706	0	0	0.6	-0.9	1.1
62505	53.3	-28.7	P	1234	0	44	1.0	0.1	1.0
62507	51.4	-10.8	P	1165	0	40	0.7	-0.7	1.0
62508	45.1	-10.7	P	680	0	1	1.0	-0.2	1.0
62509	56.1	-10.8	P	670	0	3	1.0	0.8	1.3
62512	40.3	-11.5	P	1123	0	42	1.2	0.8	1.5
62513	35.8	-29.9	P	701	0	1	1.0	0.4	1.1

IDENTIFIER	LAT.	LONG.	ELEM	NOBS	PGE	%REJ	SD	BIAS	RMS
MEAN SEA LEVEL PRESSURE									
62514	34.5	-32.0	P	767	0	11	1.1	0.0	1.1
62515	31.4	-21.9	P	687	0	0	0.9	0.1	0.9
62517	32.9	-27.8	P	689	1	1	0.9	-0.2	0.9
62519	43.8	-5.8	P	668	0	0	1.1	0.1	1.1
62599	43.1	-55.3	P	152	1	26	1.7	-0.1	1.7
62600	44.3	-42.3	P	163	0	18	2.1	-0.7	2.2
62696	57.0	-23.1	P	1331	0	48	1.2	0.0	1.2
62711	62.9	-37.8	P	1172	0	43	1.2	0.6	1.3
62712	60.9	-32.9	P	1441	1	52	1.3	0.3	1.4
62713	52.4	-22.0	P	305	0	1	1.1	0.5	1.2
64553	63.7	-25.2	P	740	0	45	0.8	-0.5	1.0
64606	63.7	-39.6	P	56	45	68	3.7	3.9	5.4
WIND SPEED									
41503	16.5	-53.6	SPEED	605	0	100	1.3	-0.4	1.3
41522	17.6	-51.1	SPEED	657	0	100	1.5	0.2	1.5
41531	28.6	-72.3	SPEED	694	0	100	1.9	0.4	1.9
41532	24.5	-66.8	SPEED	720	0	100	1.6	0.3	1.6
41533	31.3	-75.6	SPEED	642	0	100	2.2	0.8	2.3
41534	24.7	-66.2	SPEED	706	0	100	2.0	0.4	2.0
41536	20.3	-71.9	SPEED	88	1	100	3.2	-3.0	4.4
41537	25.5	-70.2	SPEED	882	0	100	1.9	0.4	1.9
41561	15.8	-75.3	SPEED	381	0	100	1.9	-0.4	1.9
41647	26.8	-62.2	SPEED	455	0	100	1.7	1.0	2.0
41648	26.8	-73.1	SPEED	699	1	100	2.5	1.4	2.9
41649	14.9	-56.5	SPEED	637	0	100	1.6	0.0	1.6
44601	35.3	-43.9	SPEED	656	1	100	2.6	-0.3	2.6
44602	47.7	-37.8	SPEED	723	2	100	3.4	0.8	3.5
62711	62.9	-37.8	SPEED	1171	0	100	3.6	2.5	4.3
62712	60.9	-32.9	SPEED	2	0	100	1.0	1.9	2.2
WIND DIRECTION									
41503	16.5	-53.6	DIRN.	416	0	0	15.5	9.3	18.1
41522	17.6	-51.1	DIRN.	402	0	0	11.5	-3.1	12.0
41531	28.6	-72.3	DIRN.	478	1	0	21.6	2.9	21.8
41532	24.5	-66.8	DIRN.	345	0	0	13.5	16.4	21.2
41533	31.3	-75.6	DIRN.	512	0	0	14.2	-2.8	14.4
41534	24.7	-66.2	DIRN.	344	0	0	11.6	8.2	14.2
41536	20.3	-71.9	DIRN.	36	3	0	28.4	63.5	69.6
41537	25.5	-70.2	DIRN.	482	1	0	15.7	-16.5	22.8
41561	15.8	-75.3	DIRN.	359	0	0	12.0	-20.3	23.6
41647	26.8	-62.2	DIRN.	183	1	0	34.8	1.0	34.8
41648	26.8	-73.1	DIRN.	483	1	0	25.5	36.0	44.2
41649	14.9	-56.5	DIRN.	549	0	0	12.1	-6.5	13.7
44601	35.3	-43.9	DIRN.	551	1	0	14.7	1.6	14.7
44602	47.7	-37.8	DIRN.	609	3	0	35.3	4.3	35.6
62711	62.9	-37.8	DIRN.	866	0	0	28.3	0.8	28.4
62712	60.9	-32.9	DIRN.	1	0	0	0.0	9.2	9.2

TABLE 9

MONTHLY MONITORING OF AIRCRAFT OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: December 2002

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Statistics for each airline carrier.
Area monitored		:40°N - 70°N, 60°W - 0°W.
Standard of comparison		:Background field from UKMO global model.
Observation times		:All hours combined.
Level(s) monitored		:300.0 - 150.0 hPa
Elements monitored		:TEMP in °C ; WIND in m s^{-1}
Parameters monitored	:N REP.	:Number of observations received excluding duplicates.
	:PG	:Percentage of observations with gross errors.
	:PR	:Percentage of observations rejected by quality control including rejections from the duplicate check.
	:PC	:Percentage of observations with calm winds.
	:RMS	:Root Mean Square difference of observations from background values excluding those with gross errors in Temperature & vector wind.
	:BIAS	:Mean difference of observations from background values excluding those with gross errors in Temperature & vector wind.
GROSS ERROR LIMITS	:10.0 °C ; 60 m s^{-1} Vector Wind	
SELECTION CRITERIA	:N REP $\geq$ 20	

NB : All American ACARS data are grouped together and statistics are shown at the bottom of the table as "US ACARS". All ADS reports are similarly grouped together.

		TEMPERATURE				WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
AAL	619	2	8	2.1	0.2	550	0	5	0	8.0	0.7
AAR	25	0	0	1.6	-0.7	24	0	0	0	6.8	-1.4
ACA	1412	0	3	1.6	-0.4	1379	0	3	0	6.8	0.6
AEA	206	0	3	1.9	0.0	104	0	3	0	7.2	1.0
AEL	416	0	9	1.9	-0.4	327	1	9	0	6.9	0.4
AFL	325	1	4	1.7	0.5	309	1	5	0	8.8	0.8
AFR	1140	1	9	1.7	0.1	937	0	9	0	8.0	0.8
AIS	170	1	13	2.5	-0.6	148	1	9	0	8.6	0.6
AJM	243	0	2	1.6	-0.4	195	0	1	0	6.7	1.0
AMM	79	0	8	1.4	0.0	62	0	13	0	9.8	-0.5
AMX	246	0	4	1.5	-0.1	179	0	80	0	9.4	1.3
AUA	22	0	5	1.1	0.0	22	0	9	0	6.9	1.6
AZA	243	1	49	2.2	-0.1	212	0	6	0	9.4	0.3
BAL	125	0	5	1.8	-0.3	114	0	4	0	7.0	1.0
BAW	503	1	10	1.9	-0.7	495	0	9	0	6.4	0.7
BHP	23	0	0	1.4	-0.8	21	5	5	0	7.0	-2.1
BMA	40	3	3	1.4	0.0	43	0	0	0	5.2	-1.0
BWA	80	0	6	1.9	0.2	53	0	13	0	8.0	0.3
CFC	23	0	4	1.4	0.0	23	0	4	0	6.4	2.5
CFG	444	1	5	1.8	-0.8	384	0	5	0	8.0	0.6
CGA	146	0	1	1.2	-0.4	137	0	1	0	4.9	0.7
CGF	31	0	3	1.6	-0.8	29	0	3	0	4.9	2.1
CGH	128	0	2	1.3	-0.4	121	0	2	0	4.4	0.2
CLX	227	0	1	1.5	-0.3	212	0	2	0	6.3	0.0
COA	107	0	42	1.4	-0.5	78	0	45	0	6.4	1.0
CRL	239	0	4	1.9	0.2	168	0	1	0	8.6	0.8
CUB	141	13	50	2.9	1.2	122	1	11	0	8.5	0.1
DAB	323	0	3	1.3	-0.4	308	0	3	0	5.2	0.8
DAI	231	0	2	1.2	0.0	215	0	2	0	4.9	0.8
DAL	735	0	14	1.7	-0.6	691	0	16	0	8.2	0.2
DBR	51	0	0	1.3	-0.6	51	0	0	0	5.8	2.2
DCE	95	0	6	1.4	-0.3	86	0	8	0	6.8	0.0
DHL	87	0	100	6.1	-5.5	84	0	87	0	9.3	2.6
DLH	742	0	8	1.4	0.0	728	0	8	0	6.2	0.9
EDW	53	4	8	1.5	-0.8	41	0	2	0	6.8	1.7
EEZ	28	4	21	2.4	-0.5	25	0	12	0	4.6	-0.1
EIA	240	3	100	3.3	1.1	230	0	100	0	19.5	7.0
ELY	148	0	2	1.5	-0.5	141	0	4	0	7.8	-0.5
ETH	27	0	4	1.4	0.1	26	0	12	0	8.9	-0.9
EWW	49	0	4	1.4	0.0	50	0	8	0	12.1	4.2
FDX	522	0	31	1.4	0.1	516	0	32	0	7.0	1.0
FGS	246	0	2	1.5	0.1	236	0	2	0	5.9	1.0
FGZ	138	0	2	1.3	-0.3	128	0	2	0	4.1	0.7
FIN	174	1	3	1.4	0.2	163	0	6	0	7.4	0.5
GCO	167	0	2	1.6	0.1	172	2	6	0	8.3	1.3
GOJ	48	0	0	1.6	-0.3	42	0	0	0	6.5	1.9
GRL	72	0	1	1.5	-0.4	65	0	0	0	4.7	0.4
GTI	224	3	11	1.7	-0.1	216	0	10	0	7.5	-0.3
GVA	35	0	0	1.4	-0.1	33	0	0	0	5.2	0.8
GVB	39	0	3	1.5	0.0	39	0	3	0	4.9	1.2
GVF	35	0	0	1.8	-1.2	35	0	0	0	5.2	1.2
GVG	31	0	0	1.5	-0.4	31	0	0	0	5.2	0.4
GVH	42	0	0	1.5	-0.7	41	0	0	0	5.0	0.9
GVL	37	0	3	1.7	-0.2	36	0	0	0	4.8	-0.2
GVR	126	0	0	1.2	-0.1	122	0	0	0	4.9	0.9
GVT	35	0	0	1.3	-0.3	34	0	0	0	4.2	0.2
GVW	29	0	7	1.2	-0.3	26	0	8	0	4.8	1.2
GVX	33	0	6	1.3	0.2	30	0	3	0	4.5	0.2
GWW	40	0	0	1.5	-0.7	38	0	0	0	4.1	1.0

	TEMPERATURE					WIND					
IDENT.	N.REP.	PG	PR	RMS	BIAS	N.REP.	PG	PR	PC	RMS	BIAS
GYM	35	0	0	1.5	-0.6	33	0	0	0	4.8	1.5
IBE	1097	1	6	1.6	0.3	704	0	8	0	7.7	0.8
ICE	611	0	3	1.5	-0.1	595	0	4	0	6.2	0.3
IWD	99	0	3	1.4	-0.1	50	0	2	0	6.3	0.7
JMC	27	0	4	1.7	-0.4	20	0	10	0	7.8	3.6
KLM	1220	1	4	1.7	-0.1	1117	0	5	0	8.0	0.2
LAN	35	0	20	2.0	0.4	32	0	31	0	15.4	-0.1
LDI	302	0	29	1.7	-1.0	238	0	2	0	7.9	0.5
LIB	208	1	10	2.0	1.2	135	1	10	0	8.1	1.9
LOT	83	0	5	1.9	-1.0	78	0	5	0	7.5	0.7
LTU	440	0	7	1.8	-0.3	385	0	6	0	6.5	0.4
MPD	112	0	2	1.6	0.2	63	0	6	0	10.2	0.1
MPH	393	0	2	1.9	-0.9	365	0	4	0	7.9	0.0
MYT	138	0	4	1.9	0.2	110	0	3	0	7.4	0.1
NCA	26	0	0	1.3	0.1	22	0	0	0	4.6	0.2
NWA	3098	1	3	1.5	0.2	3084	0	2	0	6.5	0.5
OAE	44	0	7	1.6	-0.2	45	0	33	0	15.9	8.6
PAC	223	1	5	1.6	0.0	217	0	5	0	7.9	0.4
RAM	185	3	8	1.8	-0.1	122	1	72	0	10.7	0.6
RCH	176	8	100	3.7	1.2	153	0	76	0	11.7	1.7
RJA	32	9	19	2.3	0.3	33	0	9	0	7.4	1.0
RRR	38	3	11	1.4	0.3	38	0	13	0	10.3	1.2
RZO	58	0	3	1.7	-0.6	45	2	4	0	7.5	1.3
SEU	38	3	11	2.0	0.2	26	0	8	0	6.2	0.8
SLR	109	0	6	1.5	-0.4	100	1	9	0	7.1	1.0
SVA	22	0	14	2.8	0.3	26	0	8	0	4.9	1.2
TAP	200	0	3	1.5	-0.4	120	1	6	0	8.4	0.9
TSC	39	0	3	1.4	0.1	36	0	3	0	6.9	-0.1
UAL	345	0	63	1.9	-1.0	354	0	65	0	8.8	0.3
UPS	879	0	43	1.8	0.1	846	0	42	0	7.0	0.8
USA	171	4	6	1.6	0.0	141	0	5	0	9.8	0.1
VIR	188	0	1	1.3	-0.1	188	0	2	0	7.0	1.6
WOA	135	0	5	1.4	0.1	135	1	13	0	9.7	2.1
ZKN	30	0	0	1.3	-0.4	29	0	0	0	5.5	-0.8
9VS	163	0	1	1.5	-0.1	157	0	1	0	4.9	0.1
EU	25516	0	20	1.3	0.0	25516	0	20	0	4.9	0.5
KL	1218	0	12	1.2	0.5	1216	0	12	0	5.3	1.0
LH	443	0	15	1.8	1.2	441	0	15	0	5.5	1.0
SA	33	0	15	1.1	0.7	33	0	15	0	6.2	3.2
N	2019	0	11	1.5	-0.1	1958	0	11	0	5.5	0.7
ACARS	37618	5	45	1.4	0.1	37618	0	41	0	5.4	0.3

TABLE 10

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: December 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
ELML7	00	Z	100	19	0	18.5	29.3	22.7
ELML7	12	Z	100	22	1	16.0	32.5	28.3
FNOR	00	Z	100	9	0	30.4	32.2	-10.8
FNOR	12	Z	100	9	0	27.9	28.6	-6.2
FNOU	12	Z	100	1	0	0.0	9.0	9.0
FNPH	00	Z	100	2	0	17.5	18.3	5.5
FNPH	12	Z	100	1	0	0.0	0.0	0.0
FNRS	00	Z	100	6	0	13.7	21.5	-16.5
FNRS	12	Z	100	6	0	106.1	113.8	41.3
LDWR	00	Z	100	29	0	18.7	39.2	-34.4
LDWR	12	Z	100	29	0	16.4	36.2	-32.3
OVYA2	00	Z	100	4	0	50.7	69.3	-47.3
OVYA2	12	Z	100	4	0	27.1	57.7	-51.0
OXTS2	00	Z	100	2	0	11.0	47.3	-46.0
OXTS2	12	Z	100	1	0	0.0	40.0	-40.0
OXYH2	00	Z	100	2	0	28.0	36.9	-24.0
OXYH2	12	Z	100	3	0	9.4	22.1	-20.0
V2XM	00	Z	100	3	0	12.7	16.3	-10.3
V2XM	12	Z	100	5	0	44.2	53.7	-30.4
WPKD	00	Z	100	6	1	8.0	14.7	-12.3
WPKD	12	Z	100	7	0	11.9	12.9	-4.9
ZCBP6	00	Z	100	5	0	17.3	19.8	-9.6
ZCBP6	12	Z	100	8	0	20.3	20.4	1.4
03953	00	Z	100	30	0	17.1	17.4	-3.4
03953	12	Z	100	29	0	18.5	18.6	2.6
04018	00	Z	100	30	0	15.5	27.5	-22.7
04018	12	Z	100	29	0	16.8	24.7	-18.0
04220	00	Z	100	28	0	12.6	31.3	-28.6
04220	12	Z	100	27	0	11.1	26.1	-23.7
04270	00	Z	100	29	0	18.4	35.6	-30.5
04270	12	Z	100	25	1	13.6	29.8	-26.5
04339	00	Z	100	28	0	7.7	31.3	-30.3
04339	12	Z	100	29	0	10.9	25.7	-23.3
04360	00	Z	100	29	0	14.6	39.7	-36.9
04360	12	Z	100	29	0	14.7	32.9	-29.4
08001	00	Z	100	27	0	27.2	28.4	-8.1
08001	12	Z	100	29	0	26.6	33.1	-19.7
08508	12	Z	100	29	0	20.5	26.0	16.0
08522	00	Z	100	16	0	9.9	28.0	26.2
08522	12	Z	100	27	0	17.2	29.3	23.8
08594	12	Z	100	17	0	34.8	40.1	19.8
71600	00	Z	100	30	0	15.1	31.9	-28.1
71600	12	Z	100	29	0	47.2	61.5	-39.4
72201	00	Z	100	24	0	12.3	14.0	6.7
72201	12	Z	100	24	0	11.9	15.6	10.1
72402	00	Z	100	28	0	20.9	21.5	5.2
72402	12	Z	100	30	0	27.3	27.6	4.4
74494	00	Z	100	26	0	12.4	13.5	-5.3
74494	12	Z	100	28	0	11.3	22.9	-19.9
78016	00	Z	100	26	0	13.6	36.9	34.3
78016	12	Z	100	29	0	14.8	38.8	35.9

TABLE 11

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: December 2002

Monitoring procedures:

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:GEOPOTENTIAL HEIGHT in metres
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:SD	:SD of difference of observations from background values at level shown excluding those with gross errors.
	:BIAS	:Mean difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.1

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	SD	RMS	BIAS
ELML7	00	Z	500	19	0	9.9	10.2	-2.6
ELML7	12	Z	500	22	1	7.1	9.7	6.6
FNOR	00	Z	500	9	0	8.4	8.6	-2.0
FNOR	12	Z	500	10	0	11.8	12.1	-2.6
FNOU	12	Z	500	1	0	0.0	3.0	-3.0
FNPH	00	Z	500	8	0	9.7	19.2	-16.5
FNPH	12	Z	500	6	0	5.3	10.4	-9.0
FNRS	00	Z	500	8	0	7.0	13.7	-11.8
FNRS	12	Z	500	10	0	10.6	13.8	-8.9
LDWR	00	Z	500	30	0	13.1	14.6	-6.3
LDWR	12	Z	500	29	0	12.6	14.2	-6.5
OVYA2	00	Z	500	4	0	26.4	37.4	-26.5
OVYA2	12	Z	500	4	0	11.5	18.5	-14.5
OXTS2	00	Z	500	2	0	9.0	25.6	-24.0
OXTS2	12	Z	500	1	0	0.0	25.0	-25.0
OXYH2	00	Z	500	2	0	21.5	24.9	12.5
OXYH2	12	Z	500	3	0	17.3	18.6	7.0
V2XM	00	Z	500	5	0	18.2	18.2	0.2
V2XM	12	Z	500	5	0	54.3	60.1	-25.8
WPKD	00	Z	500	7	1	4.1	6.6	-5.1
WPKD	12	Z	500	8	0	10.4	11.6	-5.3
ZCBP6	00	Z	500	6	0	17.2	22.1	-13.8
ZCBP6	12	Z	500	8	0	18.2	18.5	3.3
03953	00	Z	500	30	0	13.4	13.6	2.5
03953	12	Z	500	30	0	9.3	10.0	3.6
04018	00	Z	500	30	0	11.7	12.4	4.1
04018	12	Z	500	29	0	11.9	12.0	1.4
04220	00	Z	500	28	0	11.3	11.7	2.9
04220	12	Z	500	27	0	12.5	12.5	0.2
04270	00	Z	500	29	0	11.0	11.1	1.0
04270	12	Z	500	28	1	15.8	15.8	0.4
04339	00	Z	500	29	0	11.4	11.5	0.7
04339	12	Z	500	29	0	11.4	11.6	2.3
04360	00	Z	500	29	0	14.1	15.4	-6.1
04360	12	Z	500	29	0	14.4	15.1	-4.6
08001	00	Z	500	28	0	17.4	18.4	-5.8
08001	12	Z	500	29	0	13.8	17.4	-10.7
08508	12	Z	500	29	0	12.1	14.0	-7.0
08522	00	Z	500	16	0	8.9	9.3	-2.6
08522	12	Z	500	28	0	8.8	13.3	9.9
08594	12	Z	500	22	0	10.9	11.0	-1.4
71600	00	Z	500	30	0	19.5	23.0	-12.1
71600	12	Z	500	29	0	18.7	20.9	-9.3
72201	00	Z	500	27	0	7.9	8.4	-3.0
72201	12	Z	500	27	0	5.2	6.8	-4.4
72402	00	Z	500	28	0	13.5	13.5	0.0
72402	12	Z	500	30	0	11.6	12.5	-4.7
74494	00	Z	500	30	0	9.5	9.9	-2.6
74494	12	Z	500	29	0	10.2	10.6	-2.7
78016	00	Z	500	30	0	6.9	10.4	7.8
78016	12	Z	500	29	0	11.8	16.5	11.6

TABLE 12

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: December 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:100 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS	:Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.
GROSS ERROR LIMITS	:Defined in Appendix I.2	

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
ELML7	00	V	100	16	0	0	4.6	0.4	-0.3
ELML7	12	V	100	20	0	0	6.4	-0.2	0.4
FNOR	00	V	100	9	0	0	5.3	-1.8	2.8
FNOR	12	V	100	8	0	0	4.3	0.9	1.8
FNOU	12	V	100	1	0	0	4.8	-0.9	-4.7
FNPH	00	V	100	3	0	0	4.6	2.2	-1.5
FNPH	12	V	100	1	0	0	3.8	2.3	-3.0
FNRS	00	V	100	6	0	0	5.2	0.4	1.1
FNRS	12	V	100	6	0	0	6.8	-0.3	3.6
LDWR	00	V	100	26	0	0	3.0	0.2	-0.2
LDWR	12	V	100	29	0	0	3.4	0.5	-1.1
OVYA2	00	V	100	3	0	0	1.9	0.3	-0.9
OVYA2	12	V	100	3	0	0	5.2	-1.3	0.6
OXTS2	00	V	100	2	0	0	2.1	1.0	1.5
OXTS2	12	V	100	1	0	0	13.4	-13.3	1.0
OXYH2	00	V	100	2	0	0	2.5	0.4	-0.6
OXYH2	12	V	100	3	0	0	5.0	-4.2	-1.5
V2XM	00	V	100	3	0	0	2.1	-0.1	-0.7
V2XM	12	V	100	4	0	25	10.8	-4.2	3.0
WPKD	00	V	100	6	0	0	4.6	0.3	0.9
WPKD	12	V	100	6	0	0	4.7	-1.8	-1.0
ZCBP6	00	V	100	5	0	0	3.8	-0.1	2.7
ZCBP6	12	V	100	5	0	0	5.7	-1.6	1.9
03953	00	V	100	30	0	0	3.8	0.2	-0.3
03953	12	V	100	28	0	0	3.6	-0.2	0.7
04018	00	V	100	28	0	0	3.2	0.7	-0.5
04018	12	V	100	27	0	0	3.3	1.0	0.8
04220	00	V	100	27	0	3	4.5	-1.0	-0.4
04220	12	V	100	27	0	0	3.9	-0.9	0.8
04270	00	V	100	29	0	0	3.7	0.2	1.7
04270	12	V	100	25	0	0	4.2	0.0	1.1
04339	00	V	100	25	0	0	6.4	2.6	-1.0
04339	12	V	100	27	0	7	7.1	0.5	-0.8
04360	00	V	100	29	0	0	3.7	-0.5	0.8
04360	12	V	100	29	0	0	4.7	-1.0	1.1
08001	00	V	100	27	0	0	5.2	2.0	-1.2
08001	12	V	100	23	0	4	7.4	-0.3	-0.8
08508	12	V	100	19	0	0	4.5	0.9	-0.7
08522	00	V	100	15	0	0	4.6	-0.5	-0.3
08522	12	V	100	27	0	0	4.6	-0.4	0.0
08594	12	V	100	16	0	100	6.4	0.3	4.3
71600	00	V	100	29	0	0	5.0	1.4	1.9
71600	12	V	100	28	0	0	5.2	1.2	0.3
72201	00	V	100	24	0	0	3.8	-0.4	-1.0
72201	12	V	100	24	0	0	5.1	-0.4	-0.6
72402	00	V	100	28	0	0	5.1	1.1	-1.1
72402	12	V	100	30	0	0	4.3	1.1	-0.5
74494	00	V	100	25	0	0	3.7	-0.6	0.8
74494	12	V	100	25	0	0	4.2	-0.6	0.7
78016	00	V	100	24	0	0	6.0	1.3	-0.2
78016	12	V	100	23	0	0	5.9	-0.2	-0.7

TABLE 13

MONTHLY MONITORING OF RADIOSONDE OBSERVATIONS (COSNA)
MONITORING CENTRE: BRACKNELL
MONTH: December 2002

Monitoring procedures

Period		:One calendar month.
Data monitored		:Reports from selected radiosonde TEMPs.
Area monitored		:0°N - 90°N, 100°W - 40°E
Standard of comparison		:Background field from UKMO global model.
Position		:Average latitude and longitude for period.
Observation times		:00, 12 UTC.
Level monitored		:500 hPa.
Element monitored		:VECTOR WIND in m s^{-1}
Parameters monitored	:NUM OBS	:Number of observations available at level shown during period.
	:NUM GROSS	:Number of gross errors at level shown during period.
	:UBIAS,VBIAS:	Mean difference of observations of U and V components from background values at level shown excluding those with gross errors.
	:RMS	:Root Mean Square difference of observations from background values at level shown excluding those with gross errors.

GROSS ERROR LIMITS :Defined in Appendix I.2

WMO IDENT	OBS TIME	ELM	LEV	NUM OBS	NUM GROSS	% REJ	RMS	UBIAS	VBIAS
ELML7	00	V	500	19	0	0	4.1	-1.7	0.5
ELML7	12	V	500	22	0	0	4.0	-0.4	-0.1
FNOR	00	V	500	10	0	0	3.9	0.3	-0.2
FNOR	12	V	500	10	0	0	4.5	-0.4	0.2
FNOU	12	V	500	1	0	0	6.2	1.9	-5.9
FNPH	00	V	500	8	0	0	3.3	0.1	1.6
FNPH	12	V	500	5	0	0	3.2	-0.3	-1.3
FNRS	00	V	500	8	0	0	4.1	-1.2	-0.7
FNRS	12	V	500	10	0	0	3.4	-0.3	-0.5
LDWR	00	V	500	30	0	0	4.0	0.1	0.4
LDWR	12	V	500	29	0	0	3.2	0.0	0.9
OVYA2	00	V	500	4	0	0	5.7	0.1	-0.8
OVYA2	12	V	500	4	0	25	12.0	-5.7	3.3
OXTS2	00	V	500	2	0	0	6.2	2.7	3.6
OXTS2	12	V	500	1	0	100	21.3	13.2	-16.6
OXYH2	00	V	500	2	0	0	4.2	2.8	2.3
OXYH2	12	V	500	3	0	0	6.7	2.0	-4.2
V2XM	00	V	500	5	0	0	7.3	2.7	-2.0
V2XM	12	V	500	5	0	0	7.7	4.8	0.4
WPKD	00	V	500	7	0	0	4.0	-1.6	1.0
WPKD	12	V	500	7	0	0	4.1	-1.3	0.6
ZCBP6	00	V	500	6	0	0	7.2	-2.5	2.5
ZCBP6	12	V	500	6	0	0	2.4	0.7	0.1
03953	00	V	500	30	0	0	3.9	-0.5	1.3
03953	12	V	500	29	0	0	3.8	-0.5	-0.3
04018	00	V	500	30	0	0	4.6	0.0	0.0
04018	12	V	500	29	0	0	3.9	-0.1	-0.3
04220	00	V	500	28	0	0	4.8	-0.2	-1.3
04220	12	V	500	27	0	0	4.8	-0.6	0.3
04270	00	V	500	29	0	0	4.6	-0.1	0.6
04270	12	V	500	29	0	0	5.0	0.4	-0.4
04339	00	V	500	22	0	0	5.7	0.0	-0.5
04339	12	V	500	27	0	3	7.3	0.3	0.9
04360	00	V	500	29	0	0	4.9	-0.5	-1.8
04360	12	V	500	29	0	0	5.0	-0.9	0.9
08001	00	V	500	27	0	0	4.7	-0.1	-0.1
08001	12	V	500	29	0	3	7.5	-0.3	0.6
08508	12	V	500	19	0	0	5.5	0.1	0.1
08522	00	V	500	16	0	0	5.3	-1.0	0.5
08522	12	V	500	28	0	0	5.0	-0.2	-0.1
08594	12	V	500	22	0	100	5.0	0.9	1.7
71600	00	V	500	30	0	0	3.9	-0.2	0.5
71600	12	V	500	29	0	0	5.2	0.9	1.3
72201	00	V	500	27	0	0	3.5	-0.1	0.0
72201	12	V	500	27	0	3	6.8	0.4	-0.6
72402	00	V	500	29	0	0	3.7	0.6	-0.5
72402	12	V	500	30	0	0	3.6	0.2	-0.3
74494	00	V	500	29	0	0	5.1	-0.7	-0.6
74494	12	V	500	29	0	0	3.7	-1.1	0.5
78016	00	V	500	29	0	0	3.6	1.2	0.3
78016	12	V	500	28	0	0	5.0	1.3	-0.4

APPENDIX I

1. The gross error limits for observation minus background differences of geopotential height in Tables 5, 10 and 11 are:-

Level (hPa)	Geopotential height (metres)
1000	100
850	100
700	100
500	150
400	175
300	200
250	225
200	250
150	275
100	300
70	375
50	400
30	450

The weighted RMS values used in Table 5,10 and 11 are calculated using the following weights:-

Level (hPa)	Weight
1000	3.70
850	3.40
700	2.90
500	2.20
400	1.90
300	1.60
250	1.50
200	1.37
150	1.19
100	1.00
70	0.87
50	0.80
30	0.64

2. The gross error limits for observation minus background differences of windspeed in Tables 6,12 and 13 are:-

Level (hPa)	Windspeed m s^{-1}
1000	35
850	35
700	40
500	45
400	50
300	60
250	60
200	50
150	50
100	45